SONY

DIGITAL VIDEOCASSETTE RECORDER

DSR-85
DSR-85P

SDI INPUT/OUTPUT BOARD

DSBK-120
DSBK-120P

TIME CODE INPUT/OUTPUT BOARD

DSBK-130
DSBK-130P

SERVICE MANUAL

Vol. 1 (1st Edition/Revised 1)

DVCAM™

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

MANUAL STRUCTURE

Purpose of this manual

This manual is the Service Manual Vol.1 of the digital videocassette recorder DSR-85/85P and the option board SDI input/output board DSBK-120/120P, time code input/output board DSBK-130/130P.
This manual contains the maintenance information of this equipment, and servicing information necessary for parts replacement and adjustments.

Related manuals

In addition to this Service Manual Vol.1, the following manuals are provided.

- **Operating Instructions (Supplied with equipment)**
  Parts number : 3-858-309-14
  Explains how to operate this equipment.

- **Service Manual Vol.2 (Not supplied with equipment)**
  Parts number : 9-977-673-22
  Contains the block diagrams, board layouts, schematic diagrams, semiconductor pin assignments and parts lists.

Contents

The sections covered in the manual are summarized below to give you a general understanding of the manual.

SECTION 1 OPERATING INSTRUCTIONS

Describes the contents of the operating instructions.

SECTION 2 INSTALLATION

Describes the rack mount procedure, connectors and switch setting.

SECTION 3 SERVICE OVERVIEW

Describes the replacement of the parts, the locations of the main parts and boards, error code, notes and so on.

SECTION 4 MAINTENANCE MENU

Describes the maintenance menu.

SECTION 5 PERIODIC INSPECTION AND MAINTENANCE

Describes the periodic inspection and cleaning procedure.

SECTION 6 REPLACEMENT OF MECHANICAL PARTS

Describes the replacement procedures and adjustment after replacement.

SECTION 7 TAPE PATH ALIGNMENT

Describes the adjustment procedures of tape path system.

SECTION 8 ELECTRICAL ALIGNMENT

Describes the electrical adjustment of each board.

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SONY

3-858-309-14(1)

Digital Videocassette Recorder

Operating Instructions
Before operating the unit, please read this manual thoroughly and retain it for future reference.

DVCAM™

DSR-85/85P

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SECTION 1
OPERATING INSTRUCTIONS

This section is extracted from operation manual.

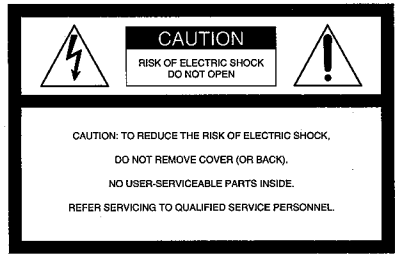
Owner's Record

The model and serial numbers are located at the rear. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. DSR-85 Serial No._____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

For the customers in the USA

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

This device requires shielded interface cables to comply with FCC emission limits.

Caution
Television programs, films, video tapes and other materials may be copyrighted.
Unauthorized recording of such material may be contrary to the provisions of the copyright laws.

Voor de klanten in Nederland

Bij dit produkt zijn batterijen geleverd. Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als KCA.

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Features

The DSR-85/85P is a 1/4-inch digital video cassette recorder that uses the DVCAM digital recording format. This system achieves stable, superb picture quality by digitally processing video signals that are separated into color difference signals and luminance signals (component method).
The DSR-85/85P unit is equipped with the variety of functions that are needed for videocassette recorders and players used in professional digital video editing systems. It features a high-speed transfer function for digital data and supports the ClipLink™ function developed by Sony Corporation for highly efficient video editing. When connected to a Sony EditStation™, the unit serves as part of a powerful non-linear editing system[1)].
The unit is also equipped with a full-fledged analog interface to support hybrid systems that combine conventional analog equipment with digital equipment.

The DSR-85/85P's main features are described below.

DVCAM Format

DVCAM is based on the consumer DV format, which uses the 4:1:1 component digital format, and provides a 1/4-inch digital recording format for professional use.

High picture quality, high stability

Video signals are separated into color difference signals and luminance signals, which are encoded and compressed to one-fifth size before being recorded to ensure stable and superb picture quality.
Because the recording is digital, multi-generation dubbing can be performed with virtually no deterioration of quality.

Wide track pitch

The recording track pitch is 15 µm, fully 50 percent wider than the DV format's 10-µm track pitch. Thanks to this feature, the DVCAM format sufficiently meets the reliability and precision requirements of professional editing.

High-quality PCM digital audio

PCM recording makes for a wide dynamic range and a high signal-to-noise ratio, thereby enhancing sound quality.
There are two recording modes: 2-channel mode (48-kHz sampling and 16-bit quantization), which offers sound quality equivalent to the DAT (Digital Audio Tape) format, or 4-channel mode (32-kHz sampling and 12-bit quantization).

Playback compatibility with DV format

A DV cassette recorded on a DV-format VCR can be played back on this unit. (Cassettes recorded in LP mode cannot be played back.)

Choice of two cassette sizes

The unit can use both standard-size and mini-size DVCAM cassettes.
- According to cassette size, it automatically changes the position of the reel drive plate.
- The maximum recording/playback times are 184 minutes for standard size cassettes and 40 minutes for mini-size cassettes.

1) **Non-linear editing**
This is an editing method that uses video and audio signals that have been digitally encoded and recorded on a hard disk as digital data. When compared with conventional (linear) editing methods, non-linear editing offers vastly improved efficiency in editing operations, such as by eliminating tape transport time.

A Wealth of Interfaces

Digital interfaces

The unit provides the following two digital interfaces.

- SDTI (QSDI)[1]: This interface enables SDTI (QSDI)-format video, audio and time code signals to be transferred between this unit and the Sony EditStation either at normal speed or four times normal.
- AES/EBU interface: This interface enables AES/EBU-format digital audio signals to be input and output.

As an option, you can also use the SDI (Serial Digital Interface) as an interface for D1 (component) format digital video and audio signals.

Analog interfaces

The unit also comes with analog interfaces enabling it to be connected to analog video and audio equipment.

- Analog video: These interfaces include a component interface, composite interface, and S-video interface.
- Analog audio: 4-channel input and 4-channel output are both provided.

Facilities for High-efficiency Editing

The unit provides an abundance of functions that enhance editing efficiency and precision.

High-speed transfer of digital signals

Using the QSDI interface enables the digital video, audio and time code signals to be transferred between this unit and the Sony EditStation ES-7 at four times the normal speed.

Supports ClipLink function

In response to commands sent from the EditStation, index pictures that are recorded on tape or ClipLink log data that is recorded in the cassette memory can be transferred to the EditStation. The EditStation operator can then efficiently use these pictures and data in a preliminary editing session.

For more information about the ClipLink function, refer to the "ClipLink™ Guide" also supplied with this unit.

Internal time code generator/reader

The unit contains a time code generator/reader which can generate and read longitudinal time code (LTC) in the SMPTE format (DSR-85) or EBU format (DSR-85P), to ensure frame-accurate editing.
When the unit is equipped with an optional DSBK-130/130P Time Code Input/Output Board, it can output the time code read from tape as analog (LTC) signal, and receive externally generated time code (LTC).

Remote control

The unit can be operated by remote control from an editing controller that supports the RS-422A interface or from a SIRCS[2]-system remote controller such as the optional DSRM-10 or SVRM-100A.

High-speed search function

The unit has a picture search function that allows you to view color picture at playback speeds up to 32 times normal speed in forward and reverse directions.
When remote-controlling this unit in shuttle mode from an editing controller or a remote controller, you can search at any speed in the range 0 (still) to 32 times normal in both directions. You can also search frame-by-frame in jog mode.
At search speeds up to 2 times normal, you can also hear playback audio.

Digital slow-motion playback

Using the frame memory function, the unit can show noise-free slow-motion playback at speeds ranging from 0 to 1/5 normal in both directions. Frame-by-frame and field-by-field playback modes are also available.

Jog audio function

When in jog mode, audio can be monitored at playback speeds ranging from 2 times to 1/30 normal in both directions. The audio signals are once stored in memory and then played back at the same rate as the search speed. This allows you to use audio playback to find the desired edit points.

Built-in TBC (Time Base Corrector)

A digital TBC is built in to ensure jitter-free video output during analog editing.

Other Features

Menu system for functionality and operation settings

The unit provides a menu system to make its various functions easier to use and set up its operation conditions.

Superimposition function

Time code numbers, operation mode indications, menus, error messages, and other text data can be superimposed and output in analog composite video signals.

Easy maintenance functions

- Self-diagnostic/alarm function: This function automatically detects setup and connection errors, operation faults, and other problems. It also displays a description of the problem, its cause, and the recommended response on the video monitor screen or time counter display.
- Digital hours meter: The unit's digital hours meter functions include four kinds of tally operations for operating hours, head drum usage hours, tape transport hours, and tape threading/unthreading times. The tally results can be viewed on the video monitor or the time counter display.

Rack mountable

When you use the optional RMM-130 Rack Mount Kit, you can mount this unit onto an EIA-standard 19-inch rack (height = 4 units).

Optional Accessories

DSBK-120/120P SDI (Serial Digital Interface) Input/Output Board

When installed in the DSR-85/85P, this board enables digital video and audio signals in the D1 format to be input to and output from the unit.

DSBK-130/130P Time Code Input/Output Board

When installed in the DSR-85/85P, this board enables SMPTE or EBU-format time code (LTC) to be input to and output from the unit.

RMM-130 Rack Mount Kit

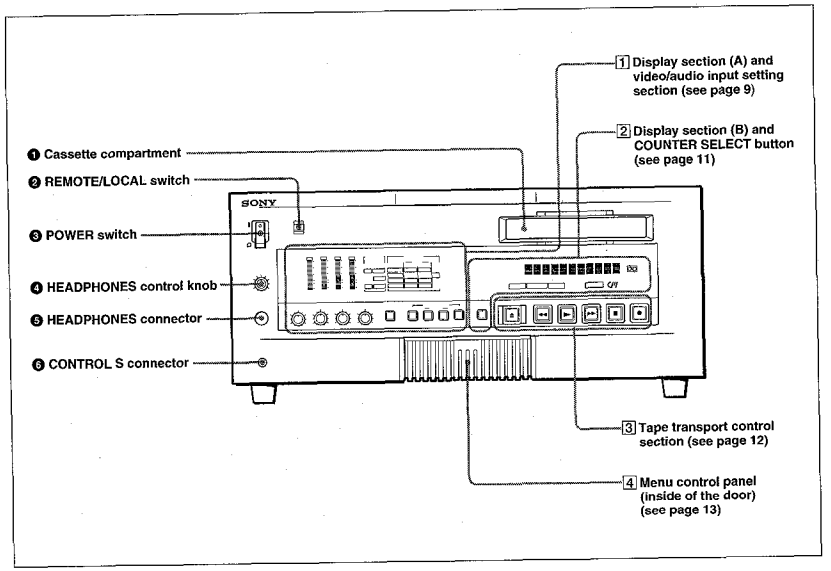
This kit can be used to mount the DSR-85/85P onto an EIA-standard 19-inch rack.

1) QSDI is a type of SDTI.
SDTI is the name of a standard interface established as SMPTE 305M.
This unit uses SDTI to transmit DV data, and the input/output connectors are labeled "SDTI(QSDI)".
In indicator and menu indications, however, the "SDTI(QSDI)" name is shortened to "QSDI".
In the remainder of this manual, the short form ("QSDI") is used.

2) **SIRCS (Sony Integrated Remote Control System)**
A command protocol to remote control Sony professional videocassette recorders/players.

Location and Function of Parts

Front Panel


1 Display section (A) and video/audio input setting section (see page 9)
2 Display section (B) and COUNTER SELECT button (see page 11)
❶ Cassette compartment
❷ REMOTE/LOCAL switch
❸ POWER switch
❹ HEADPHONES control knob
❺ HEADPHONES connector
❻ CONTROL S connector
3 Tape transport control section (see page 12)
4 Menu control panel (inside of the door) (see page 13)

❶ Cassette compartment
Accepts standard-size or mini-size DVCAM digital videocassettes. When using a mini-size cassette, insert it into the middle of the compartment.

For details of usable cassettes, see page 22.

❷ REMOTE/LOCAL switch
Selects whether the unit is operated from its front panel or from external (remote) equipment.
REMOTE : The unit is operated from an editing controller connected to the REMOTE connector on the rear panel.
LOCAL : The unit is operated from its front panel or from a SIRCS-system remote controller connected to the CONTROL S connector on the front panel.

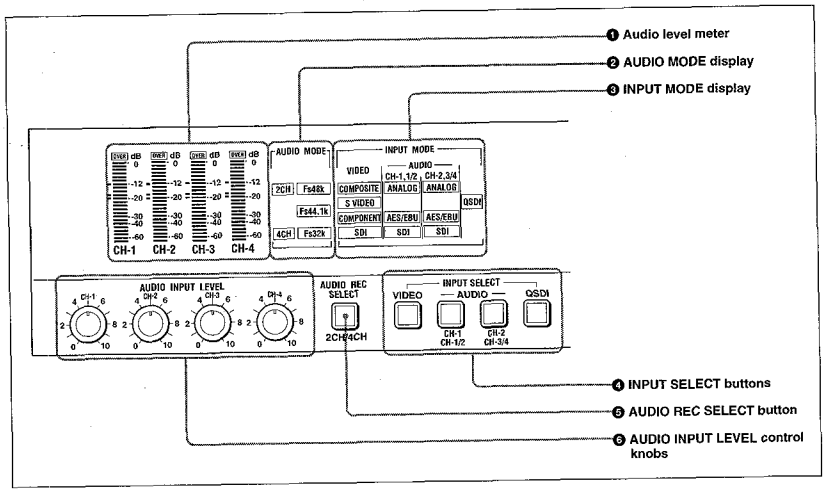
❸ POWER switch
Press on the "I" side to power on the unit. This causes the audio level meter and time counter display to light. Press on the "O" side to power off the unit.

❹ HEADPHONES control knob
Controls the volume of the headphones connected to the HEADPHONES connector.

❺ HEADPHONES connector (stereo phone jack)
Connect stereo headphones for headphone monitoring during recording or playback.
The audio signal you want to monitor can be selected with the MONITOR SELECT switches on 4 menu control panel.

❻ CONTROL S connector (stereo minijack)
Connect a SIRCS-system remote controller such as the DSRM-10.

1 Display section (A) and video/audio input setting section



❶ Audio level meter
Indicates the recording level during recording or EE mode[1] and the playback level during playback. When the audio level exceeds 0 dB, the OVER indicator lights.
The short bars to the left of some level indication bars indicate that those levels are reference audio recording levels.

❷ AUDIO MODE display
Indicates the audio mode during playback or recording or while in EE mode.
- During playback it indicates the audio mode in which the tape was recorded.
- During recording or while in EE mode, it indicates the currently selected audio recording mode. The AUDIO REC SELECT button is used for audio recording mode selection.

2CH **and** Fs48k **indicators:** Light during playback of a tape recorded in two-channel mode (48 kHz), or during two-channel mode (48 kHz) recording.
2CH **and** Fs44.1k **indicators:** Light during playback of a tape recorded in two-channel mode (44.1 kHz).
4CH **and** Fs32k **indicators:** Light during playback of a tape recorded in four-channel mode (32 kHz), or during four-channel mode (32 kHz) recording.

1) **EE mode**
"EE" stands for "Electric to Electric". When in this mode, the video and audio signals that are input to the VCR's recording circuitry do not pass through any magnetic conversion circuits but instead are output via electric circuits only. This mode is used to check input signals and adjust input levels.

❸ INPUT MODE display
Indicates the format of the currently selected video and audio input signals.

VIDEO indicators: The corresponding indicator lights when the selected video input signal is in the composite analog, S-video, component analog, or SDI (serial digital interface) format.

AUDIO CH-1, 1/2 indicators: The ANALOG, AES/EBU or SDI indicator lights for the corresponding format of the selected audio signal being input to channel 1 (when in 2-channel mode) or to channels 1 and 2 (when in 4-channel mode).

AUDIO CH-2, 3/4 indicators: The ANALOG, AES/EBU, or SDI indicator lights for the corresponding format of the selected audio signal being input to channel 2 (when in 2-channel mode) or to channels 3 and 4 (when in 4-channel mode).

QSDI: Lights when QSDI-format video and audio input signals have been selected. When QSDI is selected, all of the indicators in the VIDEO and AUDIO groups go off.

❹ INPUT SELECT buttons
Select video input signals and audio input signals.

VIDEO button: Each press of this button cycles through four video signal selection options: composite analog, S-video, component analog, and SDI. When you select one of these options, the corresponding VIDEO indicator in the INPUT MODE display lights up.

AUDIO CH-1, CH-1/2 button: Each press of this button cycles through three audio signal selection options for audio channel 1 (when in 2-channel mode) or channels 1 and 2 (when in 4-channel mode): analog, AES/EBU, and SDI. When you select one of these options, the corresponding AUDIO indicator in the INPUT MODE display lights up.

AUDIO CH-2, CH-3/4 button: Each press of this button cycles through three audio signal selection options for audio channel 2 (when in 2-channel mode) or channels 3 and 4 (when in 4-channel mode): analog, AES/EBU, and SDI. When you select one of these options, the corresponding AUDIO indicator in the INPUT MODE display lights up.

QSDI: Press this button to select QSDI signals.

If the selected signal (except for analog audio) is not supplied to the appropriate connector, the corresponding indicator flashes in the INPUT MODE display.
If the unit is not equipped with an optional DSBK-120/120P SDI Input/Output Board, no SDI indicators light in the INPUT MODE display no matter how many times you press the INPUT SELECT buttons.

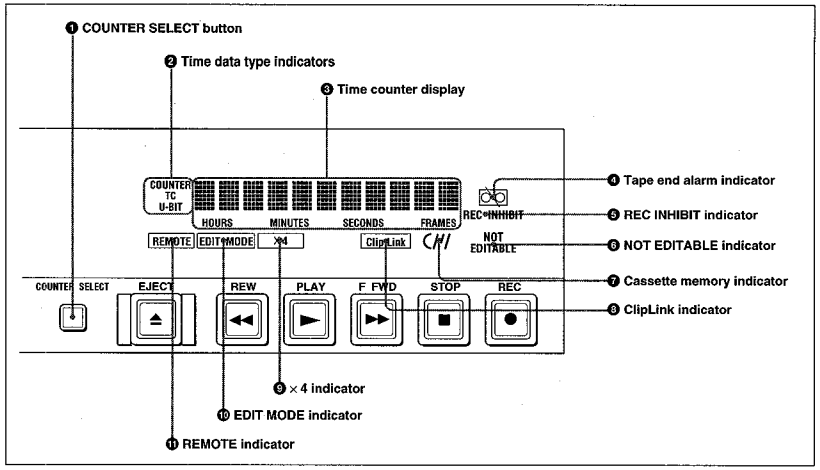
❺ AUDIO REC (recording mode) SELECT button
Selects the audio mode for recording. Each press toggles between 2-channel mode and 4-channel mode, and the indicator corresponding to the selected option lights in the AUDIO MODE display.

Note
This button works only when the unit is in EE mode.

❻ AUDIO INPUT LEVEL control knobs
When recording, you can use these knobs to set audio input levels for CH-1 (channel 1), CH-2, CH-3 and CH-4, respectively.
You can make these knobs inoperative for an AES/EBU, SDI or QSDI format digital audio input by setting "DIGITAL INPUT" under the AUDIO CONTROL menu item to "BYPASS".

On how to use the menu, see Chapter 4 "Menu Settings".

2 Display section (B) and COUNTER SELECT button



❶ COUNTER SELECT button
Selects the type of time data to be shown in the time counter display. Each press of this button cycles through three indicator display options: COUNTER (CNT: count value of the time counter), TC (time code), and U-BIT (user bits).

Note
If the REMOTE/LOCAL switch is set to REMOTE, the COUNTER SELECT button will not operate. Select the time data via the remote equipment that is connected to the REMOTE connector on the rear panel.

❷ Time data type indicators
One of the three indicators (COUNTER, TC, and U-BIT) lights to indicate the type of time data currently shown in the time counter display.

COUNTER: CNT (count value of the time counter)
TC: SMPTE time code (DSR-85) or EBU time code (DSR-85P)
U-BIT: User bit data

❸ Time counter display
Indicates the following:
- Time data: CNT (count value of the time counter), time code, or user bit data
- Digital hours meter's count value: time total for unit's operating hours, drum usage hours, etc., (selectable via the digital hours meter display menu).
- Error messages and alarm messages *(see page 73)*

❹ Tape end alarm indicator
Starts flashing when the tape's remaining capacity is for about 2 minutes.

❺ REC INHIBIT indicator
Lights when the REC/SAVE switch on the loaded cassette is in the SAVE position.

❻ NOT EDITABLE indicator
Lights during playback of a tape that contains a DV-format recording. DV-format recordings can be used as source material for editing, but editing functions such as setting IN/OUT points cannot be used.
This indicator also lights when the audio recording mode selected on this unit does not coincides with that of the loaded tape.

❼ Cassette memory indicator
Lights when a cassette provided with a memory chip ("cassette memory") is loaded.

❽ ClipLink indicator
Lights when a cassette is loaded on which ClipLink log data is stored in the cassette memory.

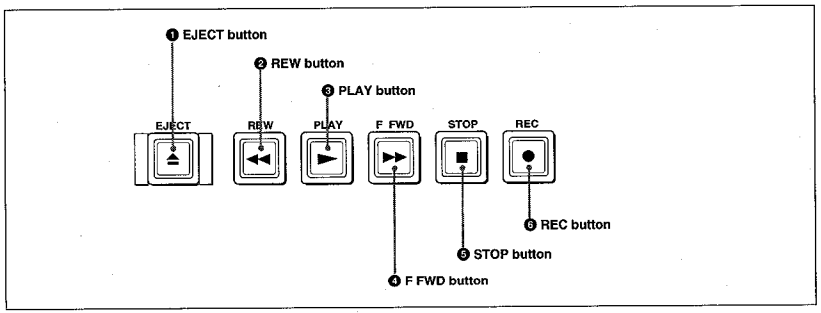
For details of ClipLink log data, refer to the "ClipLink™ Guide" also supplied with this unit.

❾ × 4 indicator
Lights when this unit is put into quadruple-speed mode.

❿ EDIT MODE indicator
Lights when this unit is selected as the recorder VCR under the control of an editing controller connected to the REMOTE connector on the rear panel of the unit.

⓫ REMOTE indicator
Lights when the REMOTE/LOCAL switch on the front panel has been set to REMOTE.

3 Tape transport control section



❶ EJECT button
When you press this button, it lights and the cassette is automatically ejected after a few seconds.

❷ REW (rewind) button
When you press this button, it lights and the tape starts rewinding. During rewind, the picture does not appear on the monitor.
However, if "F. FWD/REW" under the AUTO EE SELECT menu item is set to "PB", holding down the REW button provides a picture search function at 32 times normal speed in reverse direction.

❸ PLAY button
When you press this button, it lights and playback begins. If you press this button during recording or editing, the recording or editing operation is stopped and this unit enters playback mode.

❹ F FWD (fast forward) button
When you press this button, it lights and the tape is fast forwarded. During fast forward, the picture does not appear on the monitor.
However, if "F. FWD/REW" under the AUTO EE SELECT menu item is set to "PB", holding down the F FWD button provides a picture search function at 32 times normal speed in forward direction.

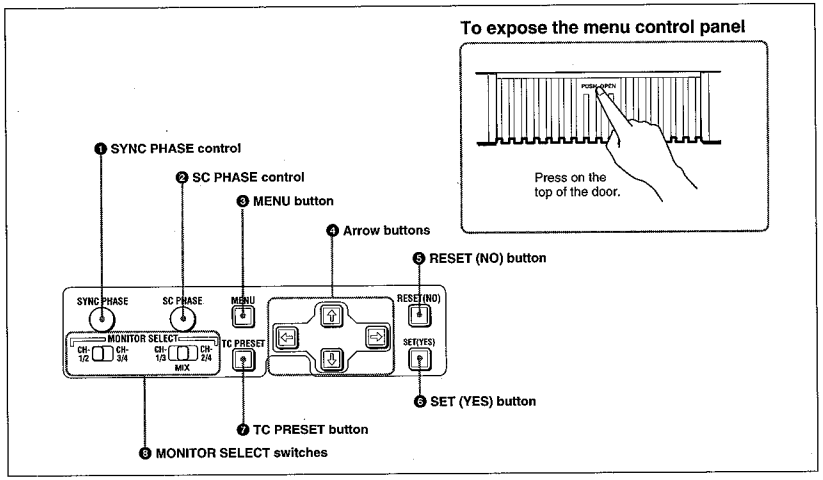
❺ STOP button
Press this button to stop the current tape transport operation.

❻ REC (record) button
When you press this button while holding down the PLAY button, it lights and recording begins.

Note
A menu setting has been selected at the factory so that no tape transport control buttons other than EJECT ❶ and STOP ❺ will work while the REMOTE indicator is lit on the front panel.

4 Menu control panel

The menu control panel is located on the inside of the door at the lower front of the unit. Press on the top of the door to open it.



❶ SYNC (synchronization) PHASE control
Turn this control to accurately adjust the synchronization phase of the output video signal of the unit with respect to the reference video signal. Use a cross-point (Phillips) screwdriver to turn it.

❷ SC (subcarrier) PHASE control
Turn this control to accurately adjust the subcarrier phase of the composite video output signal of the unit with respect to the reference video signal. Use a cross-point (Phillips) screwdriver to turn it.

❸ MENU button
Press this button to display the menu on the monitor screen and the time counter display. Press it again to return from the menu display to the usual display.

On how to use the menu, see Chapter 4 "Menu Settings".

❹ Arrow (⇧ ⇩ ⇦ ⇨) buttons
Use these buttons to move around the menu items, and also for setting time code and user bit data.

For details on setting time code and user bit data, see "Using the Internal Time Code Generator" (page 33).

❺ RESET (NO) button
Press this button to:
- reset menu settings,
- reset the time data shown in the time counter display to zero, or
- send a negative response to the unit's prompts.

❻ SET (YES) button
Press this button to:
- save new settings, such as selected menu items and time code settings, to the unit's memory, or
- send a positive response to the unit's prompts.

❼ TC (time code) PRESET button
Use this button when setting time code's initial values and user bit data.

For details on setting time code and user bit data, see "Using the Internal Time Code Generator" (page 33).

❽ MONITOR SELECT switches

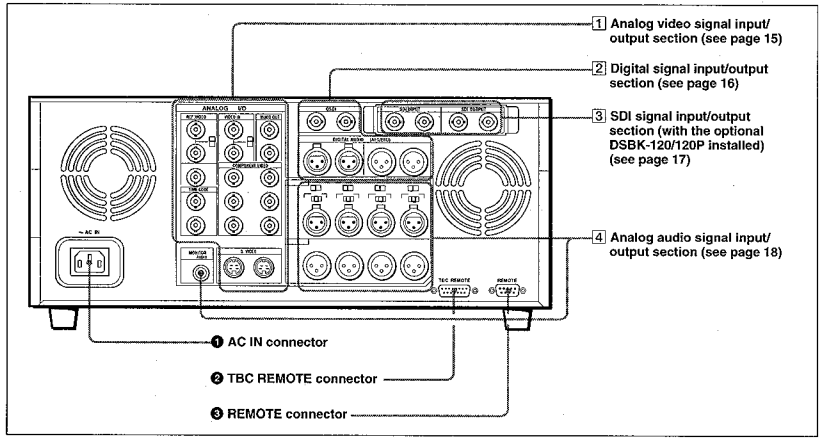
Use these switches to select the channels for audio output via the MONITOR AUDIO connector on the rear panel and the HEADPHONES connector on the front panel.

Use the left switch to select the basic channel setting, then use the right switch to select the output format (monaural, stereo, or mix).

The table at right lists the correspondence of left/right switch settings and channel/output format selections.

Switch setting		Selected channel and output format	
Left switch	Right switch	HEADPHONES connector	MONITOR AUDIO connector
CH-1/3 CH-2/4	CH-1/3 CH-2/4 MIX	Channel 1 only (monaural)	Channel 1 only (monaural)
CH-1/3 CH-2/4	CH-1/3 CH-2/4 MIX	Channels 1 and 2 (stereo)	Channels 1 and 2 (mix)
CH-1/3 CH-2/4	CH-1/3 CH-2/4 MIX	Channel 2 only (monaural)	Channel 2 only (monaural)
CH-1/3 CH-2/4	CH-1/3 CH-2/4 MIX	Channel 3 only (monaural)	Channel 3 only (monaural)
CH-1/3 CH-2/4	CH-1/3 CH-2/4 MIX	Channels 3 and 4 (stereo)	Channels 3 and 4 (mix)
CH-1/3 CH-2/4	CH-1/3 CH-2/4 MIX	Channel 4 only (monaural)	Channel 4 only (monaural)

Rear Panel


1 Analog video signal input/output section (see page 15)
2 Digital signal input/output section (see page 16)
3 SDI signal input/output section (with the optional DSBK-120/120P installed) (see page 17)
4 Analog audio signal input/output section (see page 18)
❶ AC IN connector
❷ TBC REMOTE connector
❸ REMOTE connector

❶ AC IN connector

Connect to an AC power outlet using the supplied power cord.

❷ TBC (time base corrector) REMOTE connector (15-pin)

To remote-control the built-in time base corrector, connect an optional TBC remote controller such as the UVR-60/60P, BK-2006/2007 or BVR-50/50P.

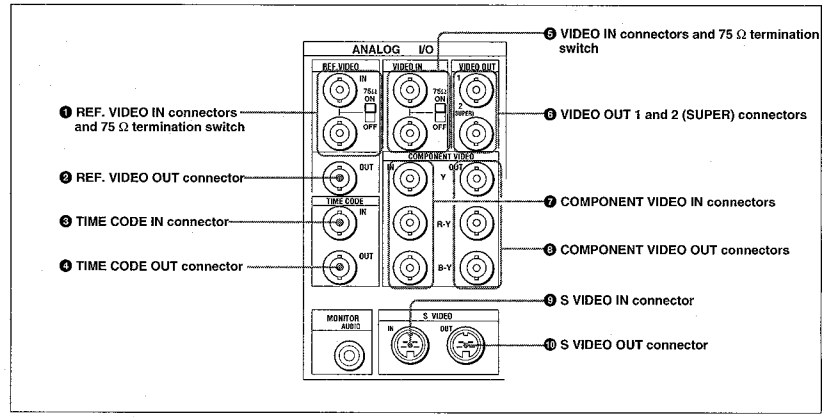
Notes

- Be sure to power off this unit before connecting the TBC remote controller to the TBC REMOTE connector.
- Only analog outputs (outputs of the connector ❻, ❽ and ❿ in 1 analog video signal input/output section) can be controlled remotely.

❸ REMOTE connector (9-pin)

When controlling this unit from an editing controller such as the ES-7, PVE-500, BVE-600/800/910, or RM-450/450CE, connect the unit to the editing controller via this connector using the supplied 9-pin remote control cable.

1 Analog video signal input/output section


❶ REF. VIDEO IN connectors and 75 Ω termination switch
❷ REF. VIDEO OUT connector
❸ TIME CODE IN connector
❹ TIME CODE OUT connector
❺ VIDEO IN connectors and 75 Ω termination switch
❻ VIDEO OUT 1 and 2 (SUPER) connectors
❼ COMPONENT VIDEO IN connectors
❽ COMPONENT VIDEO OUT connectors
❾ S VIDEO IN connector
❿ S VIDEO OUT connector
ANALOG I/O
REF VIDEO
VIDEO IN
VIDEO OUT
TIME CODE
COMPONENT VIDEO
MONITOR AUDIO
S VIDEO

❶ REF. (reference) VIDEO IN (input) connectors (BNC type) and 75 Ω termination switch

Input a reference video signal to one of these connectors. The two connectors can be used for a loop-through connection. When making a loop-through connection, set the 75 Ω termination switch to OFF and when not, set the switch to ON.

❷ REF. (reference) VIDEO OUT (output) connector (BNC type)

Outputs a reference video signal.

❸ TIME CODE IN connector (BNC type)

Input SMPTE time code (DSR-85) or EBU time code (DSR-85P) externally generated.

❹ TIME CODE OUT connector (BNC type)

When the unit is in normal-speed playback mode, this connector outputs the time code read from the tape as an analog (LTC) signal. When the unit is in any other mode, the connector outputs no signal.

Note

The TIME CODE IN connector and TIME CODE OUT connector can only be used when an optional DSBK-130/130P Time Code Input/Output Board is installed in this unit.

❺ VIDEO IN connectors (BNC type) and 75 Ω termination switch

Input a composite video signal to one of these connectors. The two connectors can be used for a loop-through connection. When making a loop-through connection, set the 75 Ω termination switch to OFF and when not, set the switch to ON.

❻ VIDEO OUT 1 and 2 (SUPER) connectors (BNC type)

Output a composite video signal. When "CHARA. DISPLAY" under the DISPLAY CONTROL menu item has been set to "ON" (factory default setting), a character signal is superimposed on the video signal that is output from the VIDEO OUT 2 (SUPER) connector.

❼ COMPONENT VIDEO IN connectors (BNC type)

Input a component (Y/R–Y/B–Y) signal.
Y: Luminance signal
R–Y and B–Y: Color difference signals

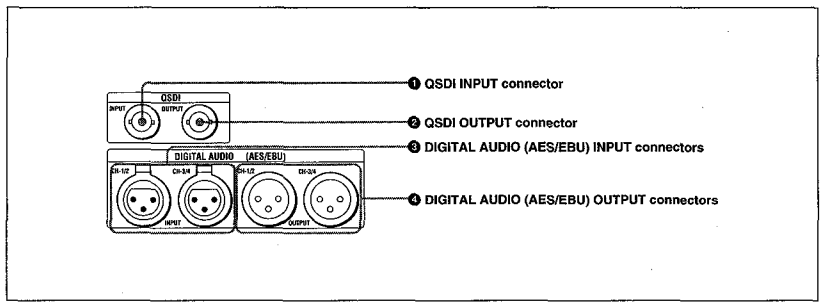
❽ COMPONENT VIDEO OUT connectors (BNC type)

Output a component (Y/R–Y/B–Y) signal.
Y: Luminance signal
R–Y and B–Y: Color difference signals

❾ S VIDEO IN connector (4-pin)
Input an S-video signal with separated Y (luminance) and C (chroma: 3.58 MHz for DSR-85 and 4.43 MHz for DSR-85P) components.

❿ S VIDEO OUT connector (4-pin)
Outputs an S-video signal with separated Y (luminance) and C (chroma: 3.58 MHz with DSR-85 and 4.43 MHz with DSR-85P) components.

2 Digital signal input/output section



❶ QSDI INPUT connector (BNC type)
Input video, audio and time code signals in the QSDI format.

❷ QSDI OUTPUT connector (BNC type)
Outputs video, audio and time code signals in the QSDI format when the unit is in playback mode, but outputs no EE signals.

Note

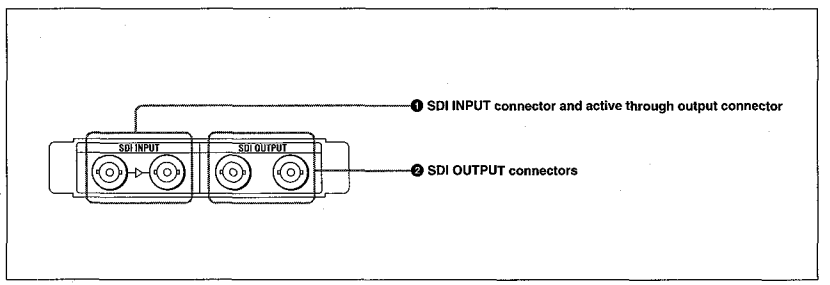
In search mode, this connector outputs unprocessed audio signals. If you are monitoring this audio signal on another device, the sound may be different from the playback output of this unit.

❸ DIGITAL AUDIO (AES/EBU) INPUT connectors (XLR 3-pin, female)
Input digital audio signals in the AES/EBU format.

❹ DIGITAL AUDIO (AES/EBU) OUTPUT connectors (XLR 3-pin, male)
Output digital audio signals in the AES/EBU format.

3 SDI (Serial Digital Interface) signal input/output section (with the optional DSBK-120/120P installed)

When an optional DSBK-120/120P SDI Input/Output Board is installed in the unit, this section can be used for inputting and outputting SDI signals.

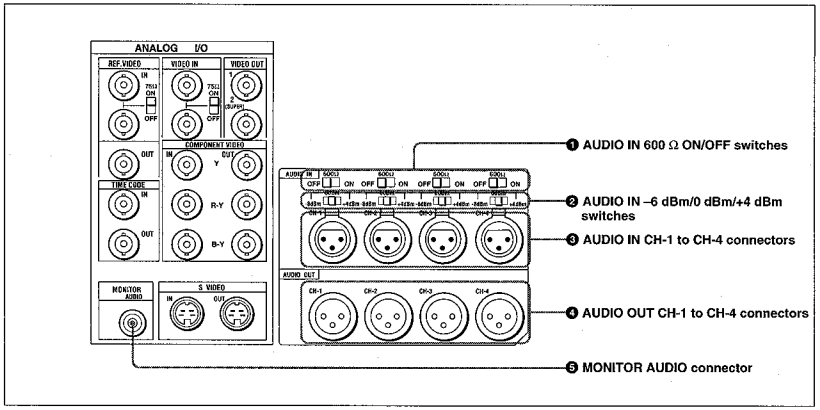


❶ SDI (Serial Digital Interface signal) INPUT connector and active through output connector (BNC type)
The left connector is for input of SDI-format digital video and audio signals. The right connector can be used as an active through output connector.

❷ SDI (Serial Digital Interface signal) OUTPUT connectors (BNC type)
Output SDI-format digital video and audio signals. The same signals are output from both connectors.

Location and Function of Parts

4 Analog audio signal input/output section



❶ AUDIO IN 600 Ω ON/OFF switches
Use these switches to select either 600 Ω impedance (the ON setting) or 10-kΩ impedance (the OFF setting) for the AUDIO IN CH-1 to CH-4 connectors.

❷ AUDIO IN –6 dBm/0 dBm/+4 dBm switches
Set these switches according to the levels of the signals input to the AUDIO IN CH-1 to CH-4 connectors.

❸ AUDIO IN CH-1 (channel 1) to CH-4 connectors (XLR 3-pin, female)
Use these connectors to connect separate channels of audio input from a player VCR or other external audio equipment.

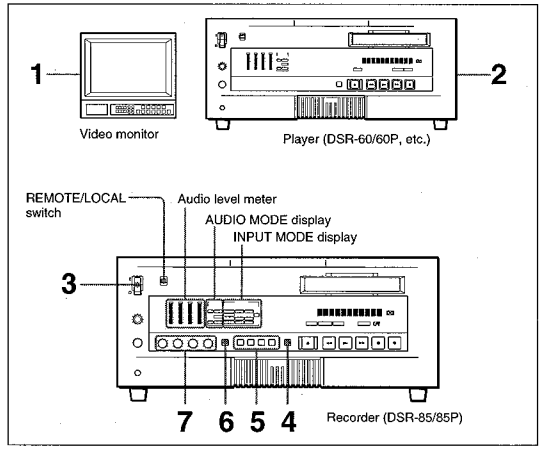
❹ AUDIO OUT CH-1 (channel 1) to CH-4 connectors (XLR 3-pin, male)
Output channel-1 to channel-4 audio signals, respectively.

❺ MONITOR AUDIO connector (RCA phono jack)
Outputs audio signals for monitoring. The audio signals to be output from this connector can be selected with the MONITOR SELECT switches on the front panel. *(See 4 menu control panel on page 13.)*

Recording

This section describes the necessary settings and operations to perform recording on this unit. The same settings and operations apply whether you are using the unit as part of an editing system, for dubbing[1], or as a stand-alone recorder. For the necessary connections for recording and the settings not covered in this section, see Chapter 5 "Connections and Settings".

Settings for Recording



Note

When controlling this unit from an editing controller, set the REMOTE/LOCAL switch to "REMOTE". When not, set the switch to "LOCAL".

1 Power on the video monitor, then set the monitor's input switches according to the input signals from this unit.

2 Set up the player to play back a tape.

For details, refer to your player's operating instructions.

3 Power on this unit by pressing on the "I" side of the POWER switch.

(Continued)

1) For dubbing of DVCAM format signals through the QSDI interface, use the auto mode (AUTO FUNCTION) execution menu item QSDI DUBBING. *For details, see the section "Dubbing Signals in QSDI Format QSDI Dubbing Function" on page 38.*

Recording

4 When the REMOTE/LOCAL switch is set to "LOCAL", use the COUNTER SELECT button to select the type of time data to be used.

Each press of this button cycles through three options: COUNTER (CNT value), TC (time code), and U-BIT (user bit data). The time data type indicator for each option lights as it is selected.

When the REMOTE/LOCAL switch is set to "REMOTE", selection of the time data type is carried out at the editing controller.

5 Select the formats of video and audio input signal to be recorded.
Press INPUT SELECT buttons to select the desired signal formats.
Each selection is shown by a lit indicator in the INPUT MODE display.

Video input signal (input connector)	Corresponding INPUT SELECT button	Lit indicator in INPUT MODE display
Composite signal (VIDEO IN)	VIDEO	COMPOSITE in VIDEO group
Separated Y/C signal (S VIDEO IN)	VIDEO	S VIDEO in VIDEO group
Component signal (COMPONENT VIDEO IN)	VIDEO	COMPONENT in VIDEO group
SDI signal (SDI INPUT)	VIDEO	SDI in VIDEO group
QSDI signal (QSDI INPUT)	QSDI	QSDI

Audio input signal (input connector)	Corresponding INPUT SELECT button	Lit indicator in INPUT MODE display
Analog signal (AUDIO IN CH-1 to CH-4)	AUDIO CH-1 CH-1/2, AUDIO CH-2 CH-3/4	ANALOG in AUDIO group
AES/EBU signal (DIGITAL AUDIO (AES/EBU) INPUT)	AUDIO CH-1 CH-1/2, AUDIO CH-2 CH-3/4	AES/EBU in AUDIO group
SDI signal (SDI INPUT)	AUDIO CH-1 CH-1/2, AUDIO CH-2 CH-3/4	SDI in AUDIO group
QSDI signal (QSDI INPUT)	QSDI	QSDI

Caution

Once you have started recording, you cannot change the input signal selection.

6 Select the audio mode.
Press the AUDIO REC SELECT button to select the desired mode.
Each selection is shown by lit indicators in the AUDIO MODE display.

Audio mode	Lit indicator in AUDIO MODE display
2-channel mode	2CH and Fs48k
4-channel mode	4CH and Fs32k

Cautions

- In the DVCAM format, there are two audio recording modes, with either two channels at 48 kHz or four channels at 32 kHz. It is not possible to select other modes (for example with four channels at 48 kHz).
- During editing, if a signal used in assemble or insert editing is in a different mode from the base tape, the signals will be discontinuous at the edit points, and correct editing will not be obtained. For this reason, audio editing between different modes is inhibited on this unit.
  For smooth editing operations, check the audio recording mode of the base tape beforehand.
- The audio mode selecting operation is only possible when the unit is in EE mode.
- Once you have started recording, you cannot change the audio mode selection.
- If on a tape there is a point where the audio mode is switched, you cannot perform an insert editing on that tape.

7 Use the AUDIO INPUT LEVEL control knobs to adjust audio input levels.
Watching the audio level meter, adjust the level so that the meter does not indicate higher values than 0 dB when the audio signal is at its maximum.
When the level exceeds 0 dB, the OVER indicator lights.

The factory-preset audio recording level is –20 dB (DSR-85) or –18 dB (DSR-85P). This setting can be changed to –12 dB using the AUDIO CONTROL menu item.

On how to use the menu, see Chapter 4 "Menu Settings".

Usable Cassettes

This unit can use standard-size and mini-size DVCAM cassettes listed below.

Model name	Size
PDV-64ME/94ME/124ME/184ME	Standard size
PDVM-12ME/22ME/32ME/40ME	Mini size

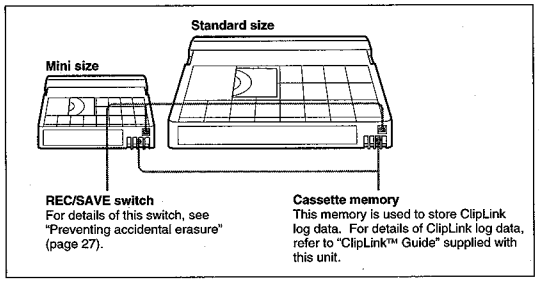
The numbers in each model name indicate the maximum recording/playback time (in minutes) for each model. For example, the PDV-184ME has a maximum recording/playback time of 184 minutes.

Notes

- If you insert an incorrect type of cassette, it will be automatically ejected.
- When operating this unit as a player, you can also use DV cassettes on the unit. However, it is the best choice to always use DVCAM cassettes because they are more reliable than DV cassettes whatever your purpose may be: playback, editing, or long-period storage of recordings.
- Cassettes that have been recorded by a DV-format recorder can be played back on this unit but cannot be used for editing operations such as the setting of edit points. When you insert such a cassette into this unit, the NOT EDITABLE indicator lights up on the front panel of the unit.

DVCAM cassettes

The following figure illustrates the DVCAM cassette's appearance.


Standard size
Mini size
REC/SAVE switch
For details of this switch, see "Preventing accidental erasure" (page 27).
Cassette memory
This memory is used to store ClipLink log data. For details of ClipLink log data, refer to "ClipLink™ Guide" supplied with this unit.

Notes on using cassettes

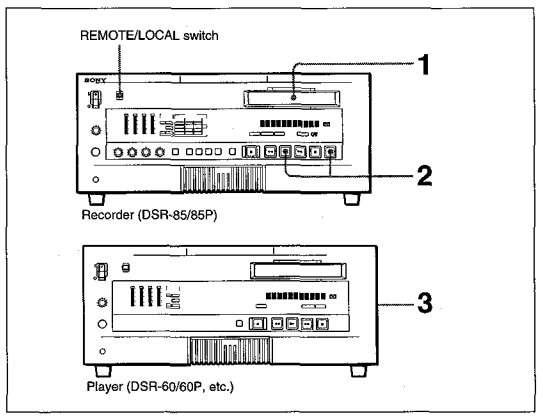
- Before storing the cassette, rewind the tape to the beginning and be sure to put the cassette in its storage case, preferably on end instead of flat on its side. The storage case of a DVCAM cassette is specially designed to ensure a long-period storage of the tape.
  Storing a cassette in any other condition (not rewound, out of its case, etc.) may cause the video and audio contents to become damaged over time.
- If the cassette memory connector (contact point) becomes dirty, connection problems may occur and cause a loss of functions. Remove away any dust or dirt from this area before using the cassette.
- If the cassette is dropped on the floor or otherwise receives a hard impact, the tape may become slackened and may not record and/or play back correctly.

For instructions on removing tape slack, see page 27.

Recording

Recording Procedure

This section describes the procedure to perform a recording on this unit, showing an example session in which playback signals coming from a player VCR will be recorded on the tape loaded in the unit.

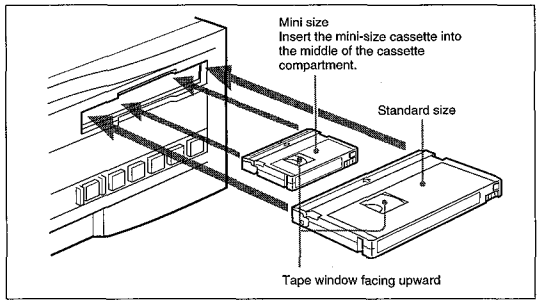


Notes

- When controlling this unit from an editing controller, set the REMOTE/LOCAL switch to "REMOTE". When not, set the switch to "LOCAL".
- If you intend to use a tape recorded on this unit in a system comprising this unit and an ES-7 EditStation, it is recommended to record color bars on at least the first 40 seconds of the tape.
  When transferring digital signals from this unit to the ES-7 EditStation at quadruple speed, there must be recording for approximately 40 seconds before the IN point.

1 After checking the following items, hold the cassette so that the tape window is facing upward, then insert it into the recorder (this unit) as illustrated on the next page.

Item to check	See section
Make sure that the cassette's "REC/SAVE" switch is set to "REC".	"Preventing accidental erasure" *(page 27)*.
Check for tape slack.	"Checking the tape for slack" *(page 27)*.
Make sure that the "HUMID!" alarm is not shown in the display window.	"Condensation" *(page 69)*


Mini size
Insert the mini-size cassette into the middle of the cassette compartment.
Standard size
Tape window facing upward

The cassette is automatically drawn into the unit and the tape is wound round the head drum. The tape is stationary while the head drum rotates, and the STOP button lights.

If the REC INHIBIT indicator lights:
It indicates that the loaded cassette's REC/SAVE switch has been set to SAVE. Press the EJECT button in the tape transport control section to remove the cassette, then set the cassette's REC/SAVE switch to REC and reload the cassette.

Note

Make sure that the unit's power is on when ejecting and loading cassettes.

2 Press and hold the REC button, and press the PLAY button.

This puts the unit into recording mode, and the tape starts moving.

3 Press the PLAY button on the player.

This starts the player's playback operation, at which point this unit starts recording the input playback signals.

Cautions

- Once you have started recording, you cannot change the audio mode selection.
- If on a tape there is a point where the audio mode is switched, you cannot perform an insert editing on that tape.

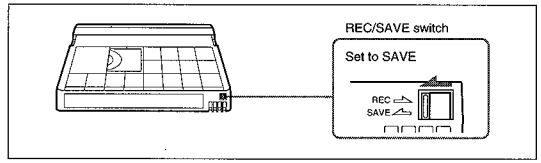
If the following indicators light when a cassette is loaded

Indicator	It means:
Cassette memory indicator	The loaded cassette contains a cassette memory.
ClipLink indicator	There is ClipLink log data stored in the cassette memory on the loaded cassette. **Caution** With such a cassette, execution of recording may destroy the ClipLink log data.
NOT EDITABLE indicator	The recording format of the tape is "DV". • If you are using the unit for recording, you can use the currently loaded tape. • You can use the currently loaded tape as a source tape for playback and editing. However, you cannot use the tape as a recording tape for editing.
	The audio recording mode selected on this unit does not coincides with that of the tape. • When your current purpose is recording, you can use the tape as it is. • When your current purpose is editing, set the unit for the same audio recording mode as with the tape. *(For more details, see "Troubleshooting" (page 71.)*

For this purpose:	Do this:
Stop recording	Press the STOP button. The unit enters stop mode, and will automatically switch to standby off mode after 8 minutes.
Remove the cassette	Press the EJECT button. After a few seconds, the tape is unwound from the head drum and the cassette is automatically ejected. If a CNT value is shown on the time counter display (assuming the time data type indicator "COUNTER" is lit), the CNT value is reset.
Inhibit the unit from outputting text information (time data, operation mode indications, etc.) to the video monitor.	Change the menu settings. *See "CHARA. DISPLAY" (page 43) in Chapter 4 "Menu Settings".*
Change the time period before the unit switches to standby off mode from stop mode	Change the menu settings. *See "TAPE PROTECTION" (page 46) in Chapter 4 "Menu Settings".*

Preventing accidental erasure

Set the REC/SAVE switch on the cassette to SAVE to prevent accidental erasure of recorded contents.

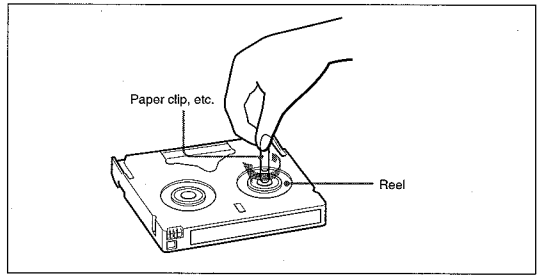


To enable re-recording

Set the cassette's REC/SAVE switch to REC.
If you insert a cassette into the unit when this switch is set to SAVE, the unit will not record when you press the PLAY button while holding down the REC button.

Checking the tape for slack

Using a paper clip or a similar object, turn the reel gently in the direction shown by the arrow. If the reel does not move, there is no slack. Insert the cassette into the cassette compartment, and after about 10 seconds take it out.



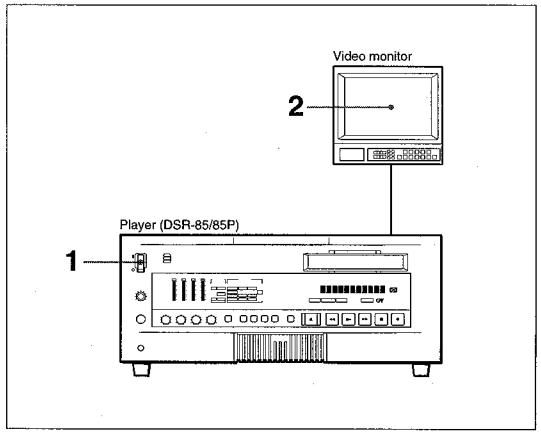
No double insertion of cassettes

When you insert a cassette, the orange lock-out plate appears in the cassette compartment to prevent double insertion.

Playback

This section describes the necessary settings and operations to perform playback on this unit. The same settings and operations apply whether you are using the unit as part of an editing system, for dubbing, or as a stand-alone videocassette player. For the necessary connections for playback and the settings not covered in this section, see Chapter 5 "Connections and Settings".

Settings for Playback

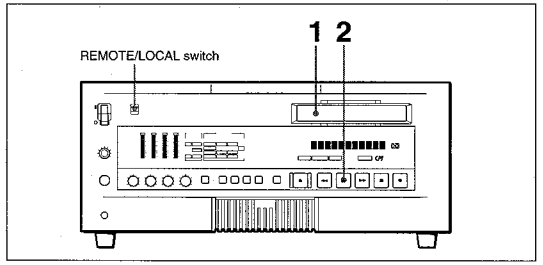


1 Power on this unit by pressing on the "I" side of the POWER switch.

2 Power on the video monitor and set the monitor's switches as shown below.

Switch	Setting
75 Ω termination switch	ON (or attach a 75 Ω terminator)
Input switch	Set according to the type of input signal from this unit.

Playback Procedure



Note

When controlling this unit from an editing controller, set the REMOTE/LOCAL switch to "REMOTE". When not, set the switch to "LOCAL".

1 Insert a cassette.

For details of cassette insertion see page 24, and for usable cassette types see page 22.

The cassette is automatically drawn into the unit. The STOP button will light, and a few seconds later a still image will appear on the monitor screen.

2 Press the PLAY button.

This starts the playback operation. When the tape is played back all the way to the end, the unit automatically rewinds it and then stops.

If the following indicators light when a cassette is loaded

Indicator :	It means:
Cassette memory indicator C///	The loaded cassette contains a cassette memory.
ClipLink indicator	There is ClipLink log data stored in the cassette memory on the loaded cassette.
NOT EDITABLE indicator	The tape was recorded in the DV format. You cannot use it as a recording tape for editing. (but as a source tape for playback and editing)

Using this unit to play back a tape recorded on another device

When playing back a tape on this unit that was recorded with a DV format VCR or some DSR-series VCRs, it is not possible to play back the first 10 seconds of the tape, because of the different tape loading mechanism. For any tape to be played back on this unit, it is recommended to make a preliminary recording for about 10 seconds at the beginning.

For this purpose:	Do this:
Stop playback	Press the STOP button. The unit enters stop mode, and will automatically switch to standby off mode after 8 minutes.
Adjust the audio playback level	Use the audio level control on the monitor.
Search while viewing	Press and hold either F FWD or REW button to search at 32 times normal speed in forward or reverse direction. To return to normal playback mode, press the PLAY button. **Note** The search picture will not be displayed unless "F. FWD/REW" under the AUTO EE SELECT menu item is set to "PB".
Inhibit the unit from outputting text information (time data, operation mode indications, etc.) to the video monitor.	Change the menu settings. *See "CHARA. DISPLAY" (page 43) in Chapter 4 "Menu Settings".*
Remove the cassette	Press the EJECT button. After a few seconds, the tape is unwound from the head drum and the cassette is automatically ejected. If a CNT value is shown on the time counter display (assuming the time data type indicator "COUNTER" is lit), the CNT value is reset.
Disable the automatic rewind function	Change the menu settings. *See "AUTO REW" (page 42) in Chapter 4 "Menu Settings".*
Change the time period before the unit switches to standby off mode from stop mode	Change the menu settings. *See "TAPE PROTECTION" (page 46) in Chapter 4 "Menu Settings".*

Setting the Time Data

This unit is provided with the following functions related to time data.
- Display and reset CNT value
- Set, display, record, and play back SMPTE/EBU time code and user bit data

When the unit is equipped with an optional DSBK-130/130P Time Code Input/Output Board, it can output the time code read from the tape as an analog (LTC) signal while in normal-speed playback mode, and receive an external analog time code (LTC) signal.

Note

Even when the unit is equipped with the DSBK-130/130P, it outputs no signal from the TIME CODE OUT connector unless it is in normal-speed playback mode.

The following explains how to use these functions.

Displaying Time Data and Operation Mode Indications

Time data and operation mode indications can be displayed on the monitor screen.
Time data can also be displayed in the time counter display on this unit.

To view time data and operation mode indications on the monitor screen

Select the DISPLAY CONTROL menu item and set "CHARA. DISPLAY" to "ON" (factory default setting).
The time data and the indication of the unit's current operation mode are superimposed on the composite video signal that is being output from the VIDEO OUT 2 (SUPER) connector, and can be viewed on the monitor screen.
Use the DISPLAY CONTROL menu item to select the information displayed and the character type and position of the indications.

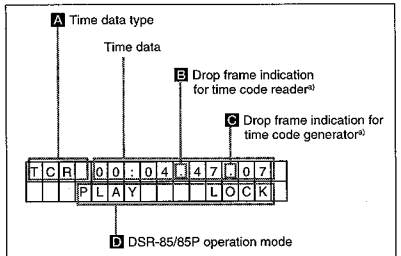
For details of these menu settings, see Chapter 4 "Menu Settings".

When you set "SUB STATUS" under the DISPLAY CONTROL menu item to other than "OFF", you can also display supplementary status information on the monitor screen about the editing mode settings, recording format of playback tape, and/or time code generator's operating mode.

For details of supplementary status information, see "Displaying Supplementary Status Information" (page 55).

Monitor screen contents

The contents of the monitor screen are shown below.


A Time data type
Time data
B Drop frame indication for time code reader a)
C Drop frame indication for time code generator a)
TCR 00:04:47:07
PLAY LOCK
D DSR-85/85P operation mode

a) This character can appear on the DSR-85 only. The character to appear in these two columns is always a colon (:) on the DSR-85P.

A Time data type

The following time data type indications are displayed.

Indication	Description
CNT	Count value of the time counter
TCR	Time code data from time code reader (factory default setting)
UBR	User bit data from time code reader
TCG	Time code data from time code generator
UBG	User bit data from time code generator
T*R	Time code data from time code reader. The asterisk indicates an interpolation by the time code reader to make up for the time code data not correctly read from the tape.
U*R	User bit data from the time code reader. The asterisk indicates that last data is retained by the time code reader, as the new data has not been read correctly from the tape.

B Drop frame indication for time code reader (on DSR-85 only)

.	Drop frame mode (factory default setting)
:	Non-drop frame mode

Setting the Time Data

C Drop frame indication for time code generator (on DSR-85 only)

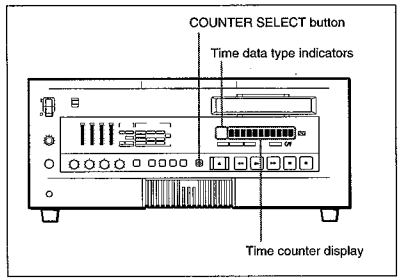
.	Drop frame mode (factory default setting)
:	Non-drop frame mode

D DSR-85/85P operation modes

Indication	Operation mode
THREADING	Tape is being threaded (this indicator is displayed from the time a cassette is inserted until the tape has been threaded)
UNTHREADING	Tape is being unthreaded (this indicator is displayed from the time the EJECT button is pressed until the cassette is actually ejected)
CASSETTE OUT	No cassette has been loaded
STANDBY OFF	Standby off mode
T. RELEASE	Tension release mode
STOP	Stop mode
F. FWD	Fast forward mode
REW	Rewind mode
PREROLL	Preroll mode
PLAY	Playback mode (servo unlocked)
PLAY LOCK	Playback mode (servo locked)
PLAY PAUSE	Playback pause mode
REC	Recording mode (servo unlocked)
REC LOCK	Recording mode (servo locked)
REC PAUSE	Recording pause mode
EDIT	Edit mode (servo unlocked)
EDIT LOCK	Edit mode (servo locked)
JOG STILL	Still picture playback in jog mode
JOG FWD	Jog forward
JOG REV	Jog reverse
SHUTTLE +2.0	Shuttle mode (playback speed) a)
PAUSE	Shuttle playback pause mode
×4 PLAY	Quadruple speed playback mode (servo unlocked)
×4 PLAY LOCK	Quadruple speed playback mode (servo locked)
×4 REC	Quadruple speed recording mode (servo unlocked)
×4 REC LOCK	Quadruple speed recording mode (servo locked)
×4 EDIT	Quadruple speed edit mode (servo unlocked)
×4 EDIT LOCK	Quadruple speed edit mode (servo locked)

a) "+2.0" in the left box is an example of playback speed indication.

To display the desired time data in the time counter display



Press the COUNTER SELECT button on the front panel of the unit.
Each press of this button cycles through three options: CNT value, time code, and user bit data. The time data type indicator for each option lights as it is selected.

Time data type indicator	Time data shown in the time counter display
COUNTER	CNT (count value of the time counter)
TC	Time code (if recording, the time code is generated by the internal time code generator; if playing back, the time code is read from the tape)
U-BIT	User bit data (if recording, the user bit data is according to the most recent settings; if playing back, the user bit data is read from the tape)

Note

The COUNTER SELECT button will not operate when the REMOTE/LOCAL switch has been set to REMOTE. Use the external equipment connected to the REMOTE connector on the rear panel to select the time data.

To reset the CNT value

Press the RESET (NO) button on the menu control panel. This resets the CNT value to 0:00:00:00.

Note

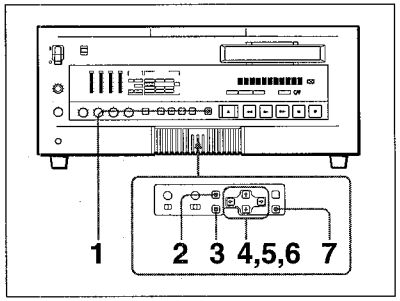
If during playback the recording on the tape includes discontinuities, the counter may operate incorrectly at the corresponding points.

Using the Internal Time Code Generator

You can set the time code's initial value before recording the time code generated by the internal time code generator onto a tape. In addition, you can set the time code's user bits to record user bit data such as the date, time, scene number, reel number, or other useful information.

When the unit is equipped with an optional DSBK-130/130P Time Code Input/Output Board, the internal time code generator can be locked to (synchronized with) an external time code.

To set the time code's initial value and user bit data



1 Press the COUNTER SELECT button to light the time data type indicator "TC" or "U-BIT".
TC: To set the time code's initial value.
U-BIT: To set user bit data

The current time code value or user bit data is shown in the time counter display.

2 Set the TIME CODE menu items as shown below.

Menu item	Setting
TC MODE	"INT"
RUN MODE	"FREE RUN" or "REC RUN"
DF MODE (on DSR-85 only)	Usually "DF"

For details of menu settings, see Chapter 4 "Menu Settings".

3 Press the TC PRESET button on the menu control panel.

The current setting is shown on the monitor screen and in the time counter display on the unit's front panel. The leftmost digit keeps flashing.
One of the following menu screens is displayed on the monitor depending on the setting made in Step **1**.

```
TC PRESET MODE

TCG  00:00:00:00

UP     :DATA INCREMENT
DOWN   :DATA DECREMENT
LEFT   :LEFT SHIFT
RIGHT  :RIGHT SHIFT
RESET  :DATA CLEAR
SET    :DATA SET
TC PSET:ABORT & EXIT
```

Time code initial value setting screen

```
UB PRESET MODE

UBG  00:00:00:00

UP     :DATA INCREMENT
DOWN   :DATA DECREMENT
LEFT   :LEFT SHIFT
RIGHT  :RIGHT SHIFT
RESET  :DATA CLEAR
SET    :DATA SET
TC PSET:ABORT & EXIT
```

User bit setting screen

Note

If you press the TC PRESET button while CNT value is being displayed, the message "COUNTER MODE IS SELECTED. SET COUNTER SELECT SWITCH TO TC OR UB" will appear on the monitor screen and "CNT mode!" will appear in the time counter display on the unit's front panel. If this happens, press the COUNTER SELECT button to light the time data type indicator "TC" or "U-BIT".

4 Use the ⇦ and ⇨ buttons to move the flashing digit to the value to be changed.

5 Use the ⇧ and ⇩ buttons to change the value of the flashing digit.
Enter hexadecimal values (0 to 9, A to F) when setting user bit data.

6 Repeat Steps **4** and **5** until you have set the desired values for all digits.
To set a value of 00:00:00:00, simply press the RESET (NO) button.

(Continued)

7 Press the SET (YES) button.

The message "NOW SAVING..." appears on the monitor screen, "Saving..." appears in the time counter display, and the new settings are stored in the unit's memory.
After this saving operation is completed, the monitor screen and the time counter display return to their usual status.

Note

The set data may be lost if you power off the unit while the above saving operation is in progress. Wait until the saving operation is completed before powering off.

Advancement of internal time code generator

The internal time code generator can advance in either of two modes, which can be set via "RUN MODE" under the TIME CODE menu item.

FREE RUN: Advancement starts when the data saving operation is completed.

REC RUN: Advancement starts when recording starts and stops when recording stops.

To set the current time as the time code's initial value

In Step **2** above, set "RUN MODE" under the TIME CODE menu item to "FREE RUN", then set the current time (format: HH:MM:SS:FF = hours: minutes:seconds:frame number) in Step **3** and subsequent steps.

Synchronizing Internal and External Time Codes

When the unit is equipped with an optional DSBK-130/130P Time Code Input/Output Board, the internal time code generator can be locked to (synchronized with) an external time code (LTC) that is input to the unit.

To synchronize the internal time code to external time code

Input an external time code (LTC) signal to the unit's TIME CODE IN connector, then set "TC MODE" under the TIME CODE menu item to "EXT REGEN". The internal time code generator locks onto the external time code and starts advancing. Once the internal time code generator has become synchronized in this way, you can disconnect the external time code input and this unit will maintain the synchronized time code.

Note

When the selected input mode is "QSDI" (the QSDI indicator is lit in the INPUT MODE display), setting "TC MODE" under the TIME CODE menu item to "EXT REGEN" causes the internal time code generator to automatically synchronize with the external time code input to the unit via the QSDI interface.

Once an external time code signal has been input, the unit's internal time code advancement mode and frame count mode are automatically set as shown below.

Advancement mode: FREE RUN

Frame count mode: Same as external time code (drop frame or non-drop frame)

To confirm external synchronization

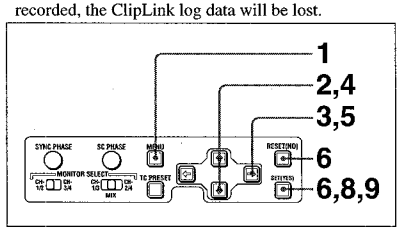
Press the STOP button to put the unit into stop mode, then press the REC button.
Look at the time counter display and check that the time code value displayed there matches the external time code value.

Rerecording the Time Code — TC Insert Function

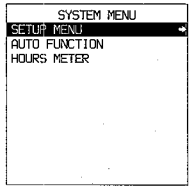
The TC insert function makes it possible to use the internal time code generator to rewrite time code and user bits when the time code recorded on a tape is discontinuous.
You can start recording time code from an initial value which can be set freely. *(See page 33.)*

Notes

- Use a tape which is recorded in the DVCAM format. (You cannot use the TC insert function with a tape recorded in DV format.)
- The time code recording starts from the tape position at which this unit was servo-locked. (From the current tape position, there is about 3 seconds delay at playback of normal speed or about 16 seconds delay at playback of 4 times normal speed.) To start time code recording at the current tape position, first rewind the tape by the time needed to allow the unit to be servo-locked before reaching the current tape position.
- If you use a tape on which ClipLink log data is recorded, the ClipLink log data will be lost.



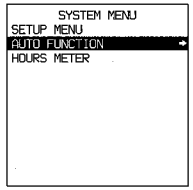
1 Press the MENU button on the menu control panel.



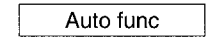
Monitor screen

Time counter display

2 Press the ⇩ button to select "AUTO FUNCTION".



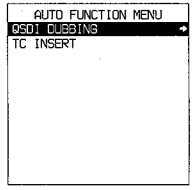
Monitor screen



Time counter display

3 Press the ⇨ button.

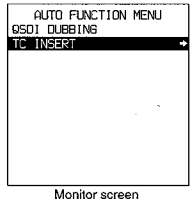
This displays the items in the level 1 of the auto mode execution menu.



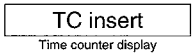
Monitor screen

Time counter display

4 Press the ⇩ button to select "TC INSERT".



Monitor screen



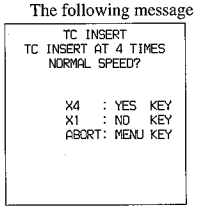
Time counter display

(Continued)

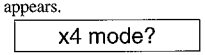
Setting the Time Data

5 Press the ⇨ button.

The following message appears.



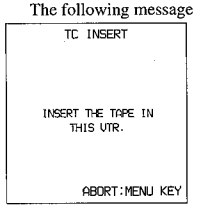
Monitor screen



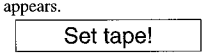
Time counter display

6 Press the SET (YES) button to perform time code recording at 4 times normal speed. Press the RESET (NO) button to perform time code recording at normal speed.

The following message appears.



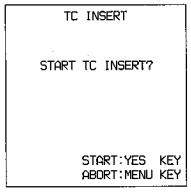
Monitor screen



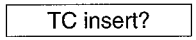
Time counter display

7 Insert the cassette.

A message to confirm the TC insert operation appears.



Monitor screen

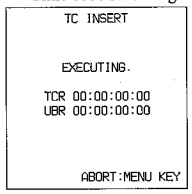


Time counter display

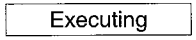
To cancel the TC insert operation
Press the MENU button.

8 Press the SET (YES) button.

Time code recording starts.



Monitor screen



Time counter display

When the recording ends, the message "TC INSERT COMPLETED. PUSH THE YES BUTTON." appears on the monitor screen and "COMPLETED" appears in the time counter display.

9 Press the SET (YES) button to exit the menu.

High-Speed and Low-Speed Search: Quickly and Accurately Determining Editing Points

Use the search function to easily locate the desired scene and to quickly and accurately determine edit points.

Search Operations via External Equipment

You can control the following operation modes of the unit either from an editing controller (such as the ES-7, PVE-500, etc.) connected to the REMOTE connector on the rear panel or from a SIRCS-system remote controller (such as the DSRM-10) connected to the CONTROL S connector on the front panel.

Shuttle: Use this mode to view color playback at speeds ranging from 0 to 32 times normal in both directions.

Note

When controlling the unit from the DSRM-10 for a shuttle-mode search, the maximum possible search speed is 16 times normal in both directions. If you want a faster search than this, hold down the F FWD or REW button. This allows you to view a color playback at 32 times normal in forward or reverse direction.

Jog: Use this mode for low-speed search and frame-by-frame search.

Digital slow: Use this mode for noise-free color playback at speeds ranging from 0 to 1/5 normal in both directions.

Still: Use this mode to view a still picture of any field.

Jog audio: Use this mode to monitor the audio track at speeds ranging from 2 times to 1/30 normal in both directions.

Note

When controlling this unit from external equipment, be sure to set the REMOTE/LOCAL switch on the unit's front panel as follows:

External equipment	REMOTE/LOCAL switch setting
Editing controller connected to REMOTE connector	REMOTE
SIRCS-system remote controller connected to CONTROL S connector	LOCAL

For a description of search operations via external equipment, see the equipment's operating instructions.

Search Operations on This Unit

Once "PB" has been set for "F. FWD" and "REW" via AUTO EE SELECT under the OPERATIONAL FUNCTION menu item (factory default setting: "PB"), you can use the F FWD button and REW button for high-speed searching. When using these buttons for high-speed searches, be sure to set the REMOTE/LOCAL switch on the front panel to LOCAL.

To do a forward high-speed search

Press and hold the F FWD button. While you are holding down the button, you can view the color playback, which is advancing 32 times normal speed.

To do a reverse high-speed search

Press and hold the REW button. While you are holding down the button, you can view the color playback, which is going at 32 times normal speed in reverse direction.

Dubbing Signals in QSDI Format — QSDI Dubbing Function

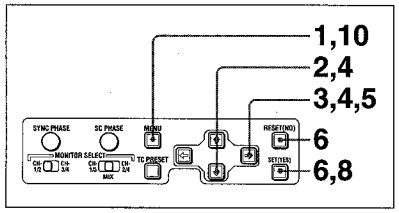
In addition to straightforward tape dubbing, you can also use this unit to dub automatically from the beginning of the tape to the end, through an QSDI interface.
When a tape recorded on a DSR-1/1P Digital Videocassette Recorder or DSR-130/130P Digital Camcorder is dubbed, the ClipLink log data held in the cassette memory can also be copied.

Notes

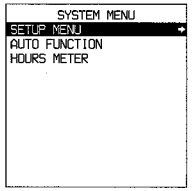
- Use a tape which is recorded in the DVCAM format. (A tape recorded in DV format cannot be used as a source tape for QSDI dubbing.)
- Regardless of the audio recording mode setting of this unit, dubbing is performed with the original audio recording mode unchanged (two-channel mode (48 kHz) or four-channel mode (32 kHz)).
- Approximately the last 2 minutes of the tape may not be copied because of differences in tape lengths. (If an Index Picture is recorded in this portion, it may also not be copied.)
- A continuous recorded section of approximately 5 seconds for normal speed dubbing (approximately 20 seconds for dubbing at 4 times normal speed) is required before the recording start point. It is recommended that you pre-record color bars or a similar signal at the start point of the source tape to be dubbed on this unit.

To carry out QSDI dubbing, this unit must be connected to the REMOTE and QSDI IN/OUT connectors on the DSR-85/85P/80/80P/60/60P.

For details of the connections and switch settings, see the section "Connections for QSDI Dubbing" (Page 64).



1 Press the MENU button on the menu control panel.



Monitor screen

Setup menu
Time counter display

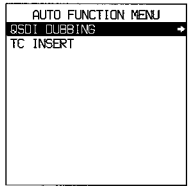
2 Press the ⇩ button to select "AUTO FUNCTION".

Monitor screen

Auto func
Time counter display

3 Press the ⇨ button.

This displays the items in the level 1 of the auto mode execution menu.

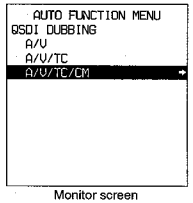


Monitor screen

QSDI DUB
Time counter display

4 Press the ⇨ button to display the menu level 2 for the item "QSDI DUBBING", and select the dubbing data with the ⇩ button.

Example: Selecting "A/V/TC/CM"

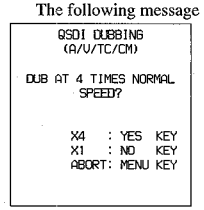


Monitor screen

>A/V/TC/CM
Time counter display

5 Press the ⇨ button.

The following message appears.

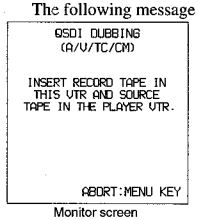


Monitor screen

x4 mode?
Time counter display

6 Press the SET (YES) button to perform dubbing at 4 times normal speed. Press the RESET (NO) button to perform dubbing at normal speed.

The following message appears.



Monitor screen

Set tape!
Time counter display

7 Insert the source tape in the player, and the recording tape in this unit.

A message to confirm the dubbing operation appears.

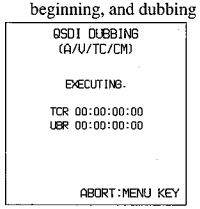
Monitor screen

Start dub?
Time counter display

To cancel the dubbing operation
Press the MENU button.

8 Press the SET (YES) button.

The tape is automatically wound back to the beginning, and dubbing starts.



Monitor screen

Executing
Time counter display

To end the dubbing operation while it is in progress
Press the STOP button.

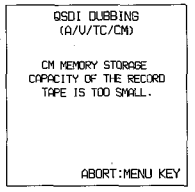
When the dubbing is completed, message "COMPLETED" appears on the monitor screen and in the time counter display.
The source tape and recording tape are both automatically rewound to the beginning, and the cassettes ejected. When the cassette is ejected, this unit returns to the state in step **6.**

9 To continue by dubbing another tape, repeat steps **7** and **8.**

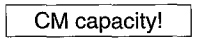
10 When the dubbing is completed, press the MENU button to exit the menu.

Dubbing Signals in QSDI Format — QSDI Dubbing Function

If the following message appears in step 7 for an A/V/TC/CM dubbing operation



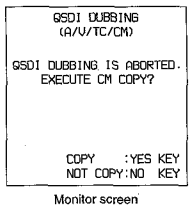
Monitor screen



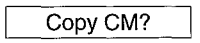
Time counter display

When carrying out A/V/TC/CM dubbing, the contents of the cassette memory of the cassettes inserted in both this unit and the player are checked.
If the cassette memory capacity of the source tape is larger than the cassette memory capacity of the recording tape, the above message appears.
In this case, replace the recording tape by a tape with a larger cassette memory capacity.

If the following message appears in step 8 for an A/V/TC/CM dubbing operation



Monitor screen



Time counter display

When carrying out A/V/TC/CM dubbing, if you press the STOP button to stop dubbing in step **8**, or if dubbing stops because the source tape is longer than the recording tape, the above message appears, to confirm whether or not to copy the contents of the cassette memory.
To copy the contents of the cassette memory, press the SET (YES) button.
If you do not wish to copy the contents of the cassette memory, press the RESET (NO) button. If you press the RESET (NO) button, however, the contents of the cassette memory may not agree with the material recorded on the tape.

Menu Organization

As shown in the figure below, the menu system consists of four levels and is functionally divided into three subsystems: the setup menu, the auto mode (AUTO FUNCTION) execution menu and the digital hours meter display menu. This chapter mainly describes the setup menu, showing its contents and how to operate it.
For details of the auto mode execution menu, see the sections "Dubbing Signals in QSDI Format" (page 38) and "Rerecording the Time Code — TC Insert Function" (page 35). For details of the digital clock display, see the section "Regular Checks" (page 69).
The items of the setup menu are divided into several functional groups on level 1, and except for the MENU GRADE item the settings themselves are made on level 2 or level 3.
Also, the menu items are divided into two categories according to how frequently they are accessed: the "basic" items, to which frequent access is normally required, and the "enhanced" items, which are less frequently used. In the following figure, the items shown in boldface are basic items, and the other items are enhanced items.
The menu settings are saved in non-volatile memory, which means they are not erased when you power off the unit after executing the setting operation.

Menu organization

Menu selection level	Level 1	Level 2	Level 3
SETUP MENU	OPERATIONAL FUNCTION	**AUTO EE SELECT**	**CASSETTE OUT**
			F.FWD/REW
			STOP
			STANDBY OFF
		LOCAL ENABLE	
		MAX SRCH SPEED	
		AUTO REW	
		PREROLL TIME	
		AFTER CUE-UP	
		PLAY START	
		A1 EDIT CH	
		A2 EDIT CH	
		A MODE CHANGE	
		QSDI AUDIO MON	
	DISPLAY CONTROL	**CHARA. DISPLAY**	
		CHARA. POSITION	
		CHARA. TYPE	
		DISPLAY INFO	
		SUB STATUS	
		MENU DISPLAY	
		PEAK HOLD	
		OVER DISP HOLD	
		BRIGHTNESS	
		ALARM	
		REF. ALARM	
	TIME CODE	**TC MODE**	
		RUN MODE	
		DF MODE (DSR-85 only)	
		UB BINARY GP.	
		TC EE OUT MODE	
	TAPE PROTECTION	FROM STOP	STOP TIMER
			NEXT MODE
		FROM STILL	STILL TIMER
			NEXT MODE
	VIDEO CONTROL	STILL MODE	
		SETUP REMOVE (DSR-85 only)	
		SETUP ADD (DSR-85 only)	
	AUDIO CONTROL	DIGITAL INPUT	
		REC POINT MUTE	
		REF LEVEL	
		AUDIO MUTE	
	MENU GRADE		
AUTO FUNCTION	**QSDI DUBBING**	**A/V**	
		A/V/TC	
		A/V/TC/CM	
	TC INSERT		
HOURS METER	**T1:OPERATION**		
	T2:DRUM ROTATION		
	T3:TAPE RUNNING		
	CT:THREADING		

Menu Contents

SETUP Menu

The purpose and settings of the setup menu items are described below.

Indications of menu Items and settings

- In the table below entitled "Menu Contents", the indication of each menu item or setting on the monitor screen is shown first, then the indication of the same item or setting on the time counter display of this unit is shown in square brackets ([ ]).

(Examples)

Indication in monitor screen	Indication in time counter display
OPERATIONAL FUNCTION	[Operational]
CASSETTE OUT	[>> Cass. out]
*EE	[>>> EE]

- Settings that have an asterisk in front of them (such as *EE) are factory default settings.
- On the time counter display, one to three ">" symbols may precede item or setting indications depending on the current menu level. Larger numbers of ">" symbols indicate lower menu levels.

Menu contents

OPERATIONAL FUNCTION [Operational]: Operation settings		Description of settings
AUTO EE SELECT [> Auto EE]: Determine whether the unit enters EE mode or PB mode when audio and video signals from other equipment are input. When this unit is used as the recorder for cut editing, it is possible to output the input audio and video signals to the monitor. The term "EE" mode is used to refer to this feature, which enables the entire editing operation to be carried out with a single monitor.	CASSETTE OUT [>> Cass. out]: Operations when the cassette has been ejected	*EE [>>> EE]: Output video and audio signals from other equipment. PB [>>> PB]: Mute video and audio signals.
	F. FWD/REW[a] [>> F. FWD/REW]: Operations when in fast forward or rewind mode	EE [>>> EE]: Output video and audio signals from other equipment. *PB [>>> PB]: Mute video and audio signals. (However, holding down the F FWD or REW button on the front panel makes this setting ineffective temporarily and allows you to perform a picture search at 32 times normal speed in forward or reverse direction.)
	STOP [>> STOP]: Operations when in stop mode	EE [>>> EE]: Output video and audio signals from other equipment. *PB [>>> PB]: The unit enters playback mode and outputs a still picture.
	STANDBY OFF [>> STBY OFF]: Operations when in standby off mode	EE [>>> EE]: Output video and audio signals from other equipment *PB [>>> PB]: The unit enters playback mode and outputs a still picture.
LOCAL ENABLE [> Local ENA]: Select which of the tape transport control buttons (EJECT, REW, PLAY, F FWD, STOP, REC) operate when the REMOTE/LOCAL switch is set to REMOTE.		ALL DISABLE [>> All DIS]: All of the tape transport control buttons are disabled. *STOP & EJECT [>> STOP & E]: Only the STOP and EJECT buttons are enabled. ALL ENABLE [>> All ENA]: All of the tape transport control buttons are enabled, and settings such as preroll time change or time data display selection are effective.
MAX SRCH SPEED [> Max SRCH]: Set the maximum value for search mode.		×16 [>> × 16]: Restrict the search speed to 16 times normal. Use this setting when using search mode for cueing. *× 32 [>> × 32]: Restrict the search speed to 32 times normal. Use this setting when using search mode for cueing. × 85 [>> × 85]: Allow searching at up to the maximum tape transport speed of 85 times normal. The picture cannot be seen on the monitor at this speed.
AUTO REW [> AUTO REW]: Determine whether or not to rewind automatically when playback reaches the end of a tape.		*ENABLE [>> ENABLE]: Rewind automatically. DISABLE [>> DISABLE]: Do not rewind automatically.

(Continued)

a) **Note**
Set this item to "PB" when you want to use the F FWD and REW buttons to view playback at 32 times normal speed. If this item is set to "EE", holding down the F FWD and REW buttons produces EE pictures.

Menu contents (Continued)

OPERATIONAL FUNCTION [Operational]: Operation settings	Description of settings
PREROLL TIME [> Preroll]: Set the preroll time.	The preroll time can be set in one-second increments to between 0 and 15 seconds (0 SEC [>> 0 SEC] to 15 SEC [>> 15 SEC]). When an editing controller such as the PVE-500 has been connected, this setting is disabled and the editing controller's setting is in effect. Operations such as the preroll time setting and the time data switching operation are also performed on the editing controller. **Factory default setting:** 5 SEC [>> 5 SEC]
AFTER CUE-UP [> After CUE]: Select the operating mode following cue-up.	STOP [>> STOP]: Stop mode *STILL [>> STILL]: Output still pictures in search mode.
PLAY START [> PLAY Start]: Set the timing for switching from stop mode to playback mode. In an editing system including an editing controller such as the PVE-500, adjusting this setting so that the delay before switching to playback mode is the same on all the decks of the editing system means that there is no longer a need to synchronize the decks for editing, and the preroll time can be shortened.	16 FRAME DELAY [>> 16 delay] to 4 FRAME DELAY [>> 4 delay]: The larger the numerical value, the longer the delay. By adjusting this setting, it is possible to reduce the phase synchronization time and preroll time during editing. **Factory default setting:** 5 FRAME DELAY [>> 5 delay] (for DSR-85) or 4 FRAME DELAY [>> 4 delay] (for DSR-85P)
A1 EDIT CH [> A1 Edit CH]: Determine which audio channel the EDIT PRESET command set on an editing controller (such as the PVE-500) for A1 is assigned to.	*CH-1 [>> CH-1]: Assign to channel 1. CH-2 [>> CH-2]: Assign to channel 2. CH-3 [>> CH-3]: Assign to channel 3. CH-1 & CH-2 [>> CH-1&2]: Assign to channel 1 and channel 2.
A2 EDIT CH [> A2 Edit CH]: Determine which audio channel the EDIT PRESET command set on an editing controller (such as the PVE-500) for A2 is assigned to.	*CH-2 [>> CH-2]: Assign to channel 2. CH-3 [>> CH-3]: Assign to channel 3. CH-4 [>> CH-4]: Assign to channel 4. CH-3 & CH-4 [>> CH-3&4]: Assign to channel 3 and channel 4.
A MODE CHANGE [> Aud change]: Determine whether or not to permit an insert editing that uses a different audio recording mode (2- or 4-channel mode) from that which was used for the tape loaded in the recorder.	*OFF [>> OFF]: Do not permit. ON [>> ON]: Permit.
QSDI AUDIO MON [> QSDI A mon]: Determine what type of audio signal to be output as EE audio when the selected input is QSDI.	*QSDI [>> QSDI]: Output the input QSDI audio as it is. ANALOG [>> Analog]: Automatically switch audio input selection and output analog audio. AES/EBU [>> AES/EBU]: Automatically switch audio input selection and output AES/EBU format digital audio. SDI [>> SDI]: Automatically switch audio input selection and output SDI format digital audio.[a]

a) Displayed only when the optional DSBK-120/120P SDI Input/Output Board is installed.

DISPLAY CONTROL [Display]: Settings related to indications on the monitor and the unit	Description of settings
CHARA. DISPLAY [> Chara disp]: Determine whether or not to output text (such as time code numbers) from the VIDEO OUT 2 (SUPER) connector.	*ON [>> ON]: Output text. OFF [>> OFF]: Do not output text. (In spite of this setting, pressing the MENU button causes menu text to be output.)
CHARA. POSITION [> Chara pos]: Set the position of text superimposed on output from the VIDEO OUT 2 (SUPER) connector to the monitor.	Use ⇦ ⇨ ⇧ ⇩ buttons on the menu control panel to adjust the indication position while watching the monitor screen. Press the MENU button to confirm the setting and return to the level 1 of the setup menu.

(Continued)

Menu Contents

Menu contents (Continued)

DISPLAY CONTROL [Display]: Settings related to indications on the monitor and the unit	Description of settings
CHARA. TYPE [> Chara type]: Set the type of characters in text superimposed on output from the VIDEO OUT 2 (SUPER) connector to the monitor.	Make the following settings while watching the monitor screen. *WHITE (WITH BKGD) [>> White]: White characters on black background BLACK (WITH BKGD) [>> Black]: Black characters on white background WHITE/OUTLINE [>> W/outline]: White characters with black outline BLACK/OUTLINE [>> B/outline]: Black characters with white outline Press the MENU button to confirm the setting and return to the level 1 of the setup menu.
DISPLAY INFO [> DISP info]: Select information superimposed on output from the VIDEO OUT 2 (SUPER) connector to the monitor.	*TIME DATA & STATUS [>> Time&STA]: Time data and operating mode indications TIME DATA & UB [>> Time&UB]: Time data selected using the COUNTER SELECT button, and user bit data. (When user bit data is selected using the COUNTER SELECT button, user bit data and time code are output.) TIME DATA & CNT [>> Time&CNT]: Time data selected using the COUNTER SELECT button, and CNT value. (When CNT is selected using the COUNTER SELECT button, CNT value and time code are output.) TIME DATA ONLY [>> Time]: Only time data REC DATE & TIME [>> REC Date]: The time data selected with the COUNTER SELECT button is shown on the time counter display, and the date and time of recording are shown on the monitor screen.
SUB STATUS [> Sub status]: Select supplementary status information superimposed on output from the VIDEO OUT 2 (SUPER) connector to the monitor *(page 53)*.	*OFF [>> OFF]: Nothing of supplementary status information. EDIT PRESET [>> Edit Pre]: Indications of the editing mode settings made from the connected editing controller. PB FORMAT [>> Format]: Indication of the recording format which was used for the tape being played back. TC MODE [>> TC mode]: Indications of the operating mode of internal time code generator. ALL [>> ALL]: All of the above-mentioned items of supplementary status information. *For details of supplementary status information displayed on the monitor when a setting other than "OFF" is selected, see "Displaying of Supplementary Status Information" (page 55).*
MENU DISPLAY [> Menu DISP]: Set the type of characters in menu text superimposed on output from the VIDEO OUT 2 (SUPER) connector to the monitor.	Make the following settings while watching the monitor screen. *WHITE [WITH BKGD] [>> White]: White characters on black background BLACK [WITH BKGD] [>> Black]: Black characters on white background WHITE/OUTLINE [>> W/outline]: White characters with black outline BLACK/OUTLINE [>> B/outline]: Black characters with white outline Press the MENU button to confirm the setting and return to the level 1 of the setup menu.
PEAK HOLD [> Peak hold]: Set the peak hold time for audio level meter.	1.5 SEC [>> 1.5 SEC] to *OFF [>> OFF]: Set the time from zero (OFF) to 1.5 seconds in steps of 0.1 second.

(Continued)

Menu contents (Continued)

DISPLAY CONTROL [Display]: Settings related to indications on the monitor and the unit	Description of settings
OVER DISP HOLD [> Hold OVER]: Determine whether or not to hold the OVER indication display on the audio level meter once the indication lights.	*OFF [>> OFF]: Do not hold the OVER indication display. ON [>> ON]: Hold the OVER indication display. **Note** With "ON" selected, once the display is held it will remain held unless you change the setting to "OFF".
BRIGHTNESS [> Brightness]: Set the brightness of front panel indicators.	Set brightness as a percentage of the maximum. *100% [>> 100%] 66% [>> 66%] 33% [>> 33%]
ALARM [> ALARM]: Determine whether alarm messages are issued or not.	*ON [>> ON]: Alarm messages are issued. OFF [>> OFF]: Alarm messages are not issued.
REF. ALARM [> REF ALARM]: Determine whether alarm messages related to reference video signal are issued or not.	ON [>> ON]: Alarm messages are issued. *ON (LIMITED) [>> ON (Limit)]: Alarm messages are issued only during recording mode, EE mode, and while editing. OFF [>> OFF]: Alarm messages are not issued.

TIME CODE [Time code]: Settings related to the time code generator	Description of settings
TC MODE [> TC MODE]: Determine whether to use internal time code (generated by the internal time code generator) or external time code.	*INT PRESET [>> INT]: Use internal time code. EXT REGEN [>> EXT]: Use external time code. **Notes** • To be able to input an LTC signal from external equipment, it is necessary to install the optional DSBK-130/130P Time Code Input/Output Board in this unit. • When the selected input mode is "QSDI" (the QSDI indicator is lit in the INPUT MODE display), setting "TC MODE" under the TIME CODE menu item to "EXT REGEN" causes the internal time code generator to automatically synchronize with the external time code input to the unit via the QSDI interface.
RUN MODE [> RUN mode]: Select the time code generator's advancement (RUN) mode.	*FREE RUN [>> FREE RUN]: Time code generator keeps running. REC RUN [>> REC RUN]: Time code generator only runs while recording. **Note** Set to "FREE RUN" when carrying out editing with an editing controller. With the "REC RUN" setting, editing and other operations will not be carried out correctly.
(Only on DSR-85) DF MODE [> DF mode]: Select whether the time code generator and time counter operate in drop frame mode or non-drop frame mode. Normally select drop frame mode, to keep in sync with real time. The non-drop frame mode is useful for example when using computer graphics, and working on a frame count basis.	*ON (DF) [>> ON (DF)]: Drop frame mode OFF (NDF) [>> OFF (NDF)]: Non-drop frame mode

(Continued)

Menu Contents

Menu contents (Continued)

TIME CODE [Time code]: Settings related to the time code generator	Description of settings
UB BINARY GP. [> UB Binary Gp]: Select the user bit binary group flag of the time code generator **Note** When the TC MODE menu item is set to EXT REGEN, the user-bit binary group flag setting follows the setting on the time code input to this unit.	*000: NOT SPECIFIED [>> 000]: Character set not specified 001: ISO CHARACTER [>> 001]: 8-bit characters conforming to ISO 646 and ISO 2022 010: UNASSIGNED-1 [>> 010]: Undefined 011: UNASSIGNED-2 [>> 011]: Undefined 100: UNASSIGNED-3 [>> 100]: Undefined 101: PAGE/LINE [>> 101]: Mutliplex 110: UNASSIGNED-4 [>> 110]: Undefined 111: UNASSIGNED-5 [>> 111]: Undefined
TC EE OUT MODE [> TC out mod]: This only appears when the optional DSBK-130/130P Timecode Input/Output Board is installed. It controls the phase of the LTC signal output when recording timecode and in "STOP REC" mode (forced EE mode).	*MUTE [>> mute]: Output no timecode. THROUGH [>> through]: Output LTC with the phase synchronized to the signal input to the TIME CODE IN connector. Use this mode when the signal input to the VIDEO IN connectors is not synchronized to the reference video signal. (See the example configuration on page 48.) VIDEO INPUT PHASE [>> V input]: Output LTC with the phase synchronized to the input video signal. Use this mode when using the video input in a bridging (loop-through) connection. (See the example configuration on page 48.) VIDEO OUTPUT PHASE [>> V output]: Output LTC with the phase synchronized to the output video signal. Use this mode when using a bridging (loop-through) connection from the output video to the input video. (See the example configuration on page 49.)

TAPE PROTECTION [Tape protect]: Settings related to tape and video head protection		Description of settings
FROM STOP [> From STOP]: Set the time to switch from stop mode to tape protection mode and select the mode for protecting the video heads and video tape.	STOP TIMER [>> STP timer]: Set the time to switch from stop mode to tape protection mode.	30 MIN [>>> 30 min] to 0.5 SEC [>>> 0.5 sec]: Select time from 16 settings ranging from 0.5 seconds to 30 minutes in steps of 0.1 second. **Factory default setting:** 8MIN [>>> 8min]
	NEXT MODE [>>> Next mode]: Select tape protection mode when time set in STOP TIMER setting elapses.	*STANDBY OFF [>>> STANDBY]: Standby off mode TENSION RELEASE [>>> T.RLSE]: The tape tension is released, but the picture can still be seen on the monitor. **Note** When the unit is in tension release mode, the head drum is still rotating, so the picture can be output and monitored. That is, it is still in "standby on" mode (i.e. is on standby). Therefore, care should be taken over the setting if it is critically important whether the unit is in "standby on" or "standby off" mode (for example when the unit is used for broadcasting).
FROM STILL [> From STILL]: Set the time to switch from still search mode or playback pause mode to tape protection mode. Also select the type of tape protection mode to follow still search mode when the set time elapses (playback pause mode is always followed by tension release mode).	STILL TIMER [>> STL timer]: Set the time to switch from still search mode or playback pause mode to tape protection mode.	30 MIN [>>> 30 min] to 0.5 SEC [>>> 0.5 sec]: Select time from 16 settings ranging from 0.5 seconds to 30 minutes in steps of 0.1 second. **Factory default setting:** 8MIN [>>> 8min]
	NEXT MODE [>>> Next mode]: Select the type of tape protection mode to follow still search mode when the time set in "STILL TIMER" elapses.	*STEP FWD [>>> Step]: The tape is advanced at 1/30 normal speed for 2 seconds. STANDBY OFF [>>> STANDBY]: Standby off mode TENSION RELEASE [>>> T.RLSE]: The tape tension is released, but the picture can still be seen on the monitor. **Note** When the unit is in step forward or tension release mode, the head drum is still rotating, so the picture can be output and monitored. That is, it is still in "standby on" mode (i.e. is on standby). Therefore, care should be taken over the setting if it is critically important whether the unit is in "standby on" or "standby off" mode (for example when the unit is used for broadcasting).

Menu contents (Continued)

VIDEO CONTROL [Video]: Settings related to video control	Description of setting
STILL MODE [> STILL mod]: Determine whether the image of a whole frame or a field is output in still playback mode.	FRAME STILL [>> Frame]: Output the image of a whole frame. *FIELD 1 STILL [>> Field 1]: Output the image of field 1 only. FIELD 2 STILL [>> Field 2]: Output the image of field 2 only.
(Only on DSR-85) SETUP REMOVE [> Setup rmv]: Determine whether or not to remove black setup from analog video input signals.	*OFF [>> OFF]: Do not remove black setup. ON [>> ON]: Remove black setup.
(Only on DSR-85) SETUP ADD [> Setup add]: Determine whether or not to add black setup to analog video output signals.	*OFF [>> OFF]: Do not add black setup. ON [>> ON]: Add black setup.

AUDIO CONTROL [Audio]: Settings related to audio control	Description of setting
DIGITAL INPUT [> Digi. Input]: Enable or disable the AUDIO INPUT LEVEL control knobs to work for AES/EBU, SDI, or QSDI format digital audio input.	*VARIABLE [>> Variable]: Enable the control knobs. BYPASS [>> Bypass]: Disable the control knobs.
REC POINT MUTE [> REC pt mute]: Determine whether or not to mute audio at the joints of recordings.	*OFF [>> OFF]: Mute. ON [>> ON]: Do not mute.
REF LEVEL [> REF Level]: Select reference audio level.	Select the level from among the following three: –12dB [>> –12dB], –18dB [>> –18dB], and –20dB [>> –20dB] **Factory default setting:** –20 dB (DSR-85), –18 dB (DSR-85P)
AUDIO MUTE [> Audio mute]: Select whether or not to mute the output until the audio signal has stabilized, in the transition from still/search mode to playback.	ON [>>ON]: Mute. *OFF [>>OFF]: Do not mute. (This reduces the time delay until the audio signal is output.) **Notes** • In the transition from the stop mode to playback, muting is always applied until the audio signal has stabilized. • The search speeds at which an audio signal can be output vary from model to model.

MENU GRADE [Menu grade]: Selection of menu items to be displayed	Description of settings
Determine whether to display basic items only or both basic and enhanced items on the monitor screen and on the time counter display when using the menu.	*BASIC [> Basic]: Display basic items only. ENHANCED [> Enhanced]: Display both basic and enhanced items.

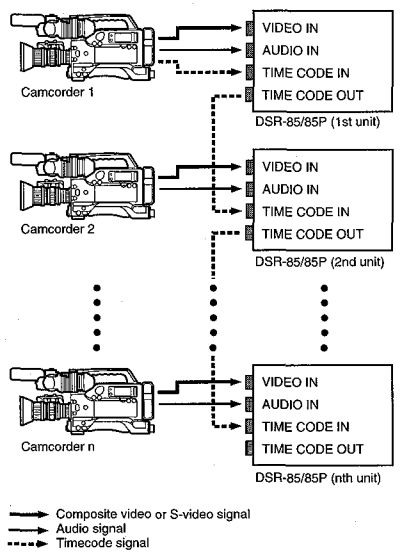
Menu Contents

TC EE OUT MODE settings

Use the following as reference information when setting "TC EE OUT MODE" *(see page 46)*.

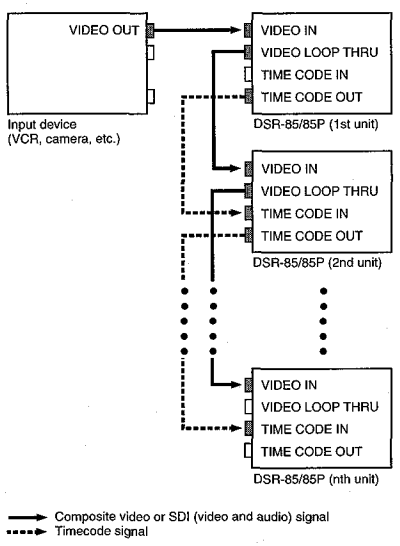
• THROUGH mode

In this mode, the LTC signal is output with the phase synchronized to the input timecode signal, and is appropriate when recording signals from multiple devices on a number of VCRs.
When the camcorder is in genlock mode the timecode precision is ±0 frames, and when not in genlock mode is ±1 frame.



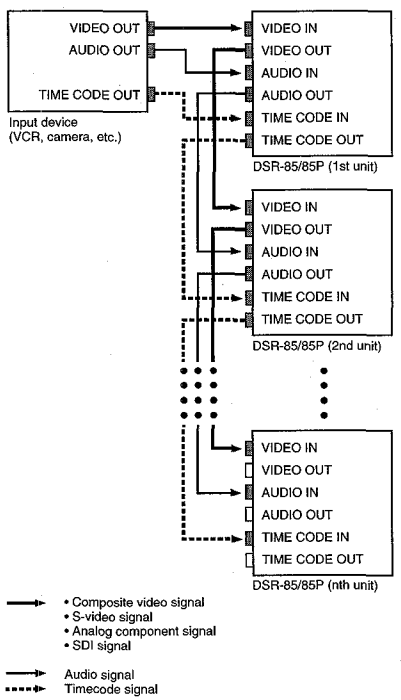
• VIDEO INPUT PHASE mode

The timecode output signal is synchronized to the input video signal.
This mode is appropriate when the output from a single device is recorded on a number of VCRs. The connections are loop-through connections.
In this mode, the same timecode is recorded on all of the VCRs 1 to n.



• VIDEO OUTPUT PHASE mode

The timecode output signal is synchronized to the output video signal.
This mode is appropriate when the output from a single device is output to a number of VCRs with separate cables for video, audio, and timecode.
In this mode, the same timecode is recorded on all of the VCRs 1 to n.



Auto mode (AUTO FUNCTION) execution menu

The following table shows the purpose and function of the items in the auto mode execution menu.

For details of the use of individual items, see the sections "Dubbing Signals in QSDI Format" (page 38) and "Rerecording the Time Code — TC Insert Function" (page 35).

Menu contents

QSDI DUBBING [QSDI dub]: Selection of data for QSDI dubbing	Description of setting
For dubbing through the QSDI interface, select data that the dubbing applies to.	A/V [> A/V]: Dub the audio and video. A/V/TC [> A/V/TC]: Dub the audio, video, and time code. A/V/TC/CM [> A/V/TC/CM]: Dub the audio, video, time code, and cassette memory contents. **Note** When "A/V" is selected, the time code recorded follows the setting of the TIME CODE item in the setup menu.

TC INSERT [TC insert]: Time code rewriting	Description of setting
Rewrite the time code from an initial value which can be set freely.	—

Changing Menu Settings

This section explains how to change menu settings.

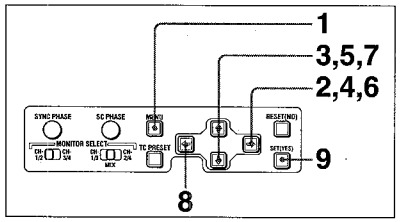
Buttons Used to Change Settings

Use the following buttons on the menu control panel to change the menu settings.

Menu control buttons	Functions
MENU button	• Opens the menu and launches menu control mode. • Closes the menu and exits menu control mode.
⇧ and ⇩ buttons	These buttons move the highlighted cursor up and down within the current level to select an item or setting. Hold down one of these buttons to make the highlighted cursor move continuously.
⇦ and ⇨ buttons	• Press the ⇨ button to go down one level. • Press the ⇦ button to go up one level. Hold down one of these buttons to make the highlighted cursor move continuously.
RESET (NO) button	• Returns the setting to the factory default setting. • Sends a negative response to prompts on the monitor screen.
SET (YES) button	• Saves the new setting in memory. • Sends a positive response to prompts on the monitor screen.

Changing the Settings of Basic Items

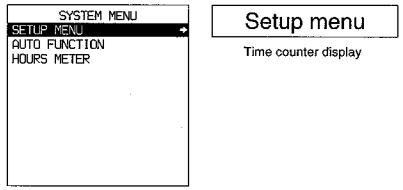
The factory default setting is to display only basic items. To change the settings of basic items proceed as follows.



1 Press the MENU button on the menu control panel.

The menu selection level display appears on the monitor, with "SETUP MENU" selected (shown in reverse video).
The time counter display of this unit shows only the currently selected item. When the item name is long, it is abbreviated.

Menu selection level display

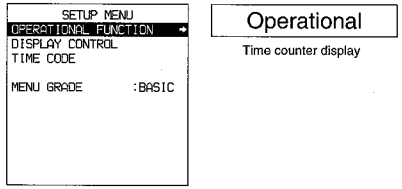


Monitor screen

2 Press the ⇨ button.

This displays all items in the menu level 1.

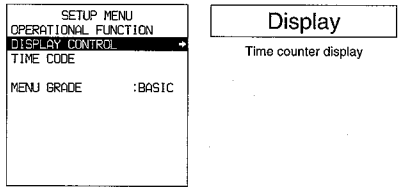
Level-1 menu display



Monitor screen

3 Press the ⇩ or ⇧ button, to select the required item.

Example: Display when "DISPLAY CONTROL" is selected



Monitor screen

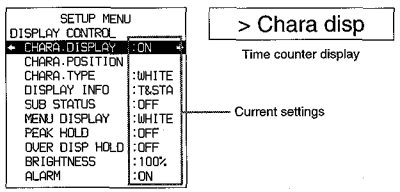
(Continued)

Changing Menu Settings

4 Press the ⇨ button.

This displays the menu level 2 for the menu item selected in step **3.**

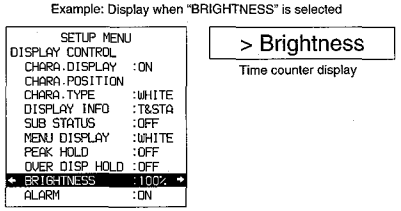
Example: Level-2 display for "DISPLAY CONTROL"



Monitor screen

5 Press the ⇩ or ⇧ button to select the item whose setting you wish to change.
For menu items with a level 3, press the ⇨ button to go to the level 3, then press the ⇩ or ⇧ button to select the item whose setting you wish to change.

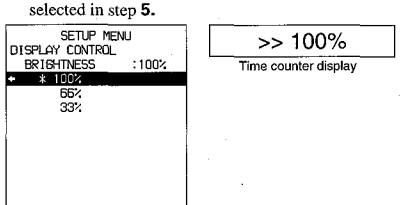
Example: Display when "BRIGHTNESS" is selected



Monitor screen

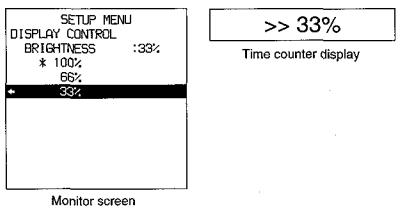
6 Press the ⇨ button.

This displays all possible settings for the item selected in step **5.**



Monitor screen

7 Press the ⇩ or ⇧ button to change the setting of the item.



Monitor screen

8 To change other settings, press the ⇦ button to return to the previous screen, then repeat steps **5** to **7** as required.

9 When you have completed the settings, press the SET (YES) button.

The message "NOW SAVING..." appears on the monitor screen, and "Saving..." appears in the time counter display, while the new settings are saved in the unit's memory.
When the saving operation is completed, the monitor screen and time counter display return to their normal indications.

Notes

- If you power off the unit before setting operation is completed, settings will be lost. Wait until the saving is completed before powering off the unit.
- If instead of pressing the SET (YES) button you press the MENU button, the new settings are not saved. The message "ABORT !" appears both on the monitor screen and in the time counter display for 0.5 seconds, and the system forcibly exits the menus. To change more than one setting, be sure after making the settings to press the SET (YES) button.

Meanings of indications on the monitor screen

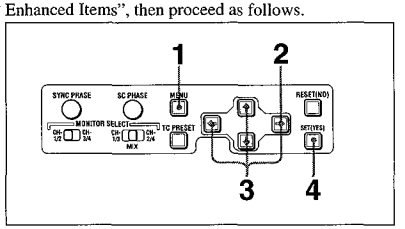
On-screen indication	Meaning
Right-pointing arrow at the right of a menu item *(See step 1 on page 51.)*	Pressing the ⇨ button switches to the next lower menu level or to a setting selection screen.
Left-pointing arrow at the left of a menu item *(See step 4 on page 52.)*	Pressing the ⇦ button returns to the previous (higher) menu level.
Character string at the right of a menu item *(See step 4 on page 52.)*	Current setting of the menu item. When shown with a colon: the current setting is the same as the factory default. When shown with a raised dot: the current setting is different from the factory default. *(See step 2 on this page.)*
An asterisk by a complete list of settings *(See step 6 on page 52.)*	Factory default setting.

Displaying Enhanced Items

The factory default setting is not to display enhanced items.
To display enhanced items, use the procedure in the previous section, "Changing the Settings of Basic Items", to set the item "MENU GRADE" to "ENHANCED". *(In step **3** on page 51 select "MENU GRADE", and select "ENHANCED", then press the SET (YES) button to save the setting in memory).*
Once the menu item "MENU GRADE" is set to "ENHANCED", when you press the MENU button and the ⇨ button to display the SETUP menu, all basic and enhanced items in the menu level 1 appear.

Changing the Settings of Enhanced Items

To change the settings of enhanced items, first carry out the procedure in the previous section "Displaying Enhanced Items", then proceed as follows.



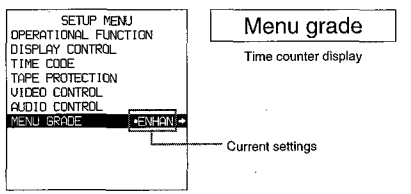
1 Press the MENU button on the menu control panel.

The menu selection level display appears on the monitor.

2 Press the ⇨ button.

This displays all basic and enhanced items in the menu level 1.

Level-1 menu display



Monitor screen

3 Follow the same procedure as in steps **3** to **8** of the procedure in the section "Changing the Settings of Basic Items", using the arrow buttons to select an item and change its setting.

(Continued)

4 When you have completed the settings, press the SET (YES) button.

The message "NOW SAVING..." appears on the monitor screen, and "Saving..." appears in the time counter display, while the new settings are saved in the unit's memory.
When the saving operation is completed, the monitor screen and time counter display return to their normal indications.

Returning Menu Settings to Their Factory Defaults

After making menu setting changes, to return settings to their factory defaults, use the following procedure.

To return a particular setting to its factory default

In the display for changing the setting in question, press the RESET (NO) button.

Carry out the procedure in the section "Changing the Settings of Basic Items" *(page 51)* up to step **6**, then with the list of the setting displayed (in the example, if the setting has been changed it will be "66%" or "33%") press the RESET (NO) button, to return the setting to its factory default of "100%".

To return all settings to their factory defaults

1 Press the MENU button on the menu control panel, to display the menu selection.

2 Press the ⇨ button, to display level 1 of the setup menu.

3 Press the RESET (NO) button.

A message appears, to confirm whether or not you wish to return all settings to their factory defaults.

Monitor screen message	"INITIALIZE ALL ITEMS TO FACTORY PRESET VALUES?"
Message in the time counter display	"Init setup?"

4 Press the SET (YES) button.

The message "NOW SAVING..." appears on the monitor screen, and "Saving..." appears in the time counter display, while the settings of all items are returned to their factory defaults, and these factory defaults are saved in the unit's memory.

Note

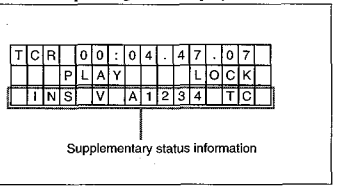
If you power off the unit while settings are being saved, settings may not be correctly returned to their factory defaults. Wait until the saving is completed before powering off the unit.

To abandon the resetting operation

Instead of pressing the SET (YES) button, press the RESET (NO) button. The display returns to menu level 1, leaving the settings unchanged.

Displaying Supplementary Status Information

When you set "SUB STATUS" under the DISPLAY CONTROL menu item to other than "OFF", you can view supplementary status information on the monitor screen below the operating mode display area.



The following items of supplementary status information are displayed depending on the setting of "SUB STATUS".

Setting of "SUB STATUS"	Items of supplementary information displayed
EDIT PRESET	Editing mode settings made on the editing controller
PB FORMAT	Recording format of the tape being played back
TC MODE	Operating mode of the internal time code generator
ALL	All of the above items

The following tables show the on-screen indications of supplementary information and their meaning.
In each table, the indications given in brackets such as [ASM] are the indications displayed when "SUB STATUS" is set to "ALL". (For the display format when "ALL" is selected, see the next paragraph.)

When "SUB STATUS" is set to "EDIT PRESET":

On-screen indication	Meaning
ASM [ASM]	Assemble editing mode
INS V A1234 TC [V1234T]	INS: Insert editing mode V A1234 TC: Channel or signal selected for insert editing V: Video A1234: Audio 1, 2, 3, 4 TC: Time code

When "SUB STATUS" is set to "PB FORMAT":

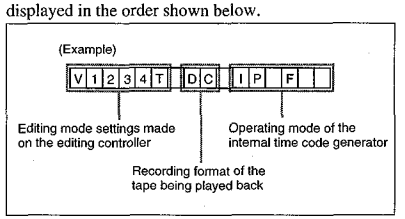
On-screen indication	Meaning
DVCAM [DC]	DVCAM format
DV [D]	DV format (SP mode)
DV(LP) [D]	DV format (LP mode)

When "SUB STATUS" is set to "TC MODE":

On-screen indication	Meaning
INT PRESET FREE [IP F]	The internal time code generator is operating in FREE RUN mode.
INT PRESET REC [IP R]	The internal time code generator is operating in REC RUN mode.
EXT LTC-T&U [ELTU]	The internal time code generator is in synchronization with external time code (LTC) input to the unit via optional DSBK-130/130P board and is generating the same time code value and user bit value as those of the external time code.
EXT QSDI-T&U [EQTU]	The internal time code generator is in synchronization with external time code input to the unit via QSDI interface and is generating the same time code value and user bit value as those of the external time code.

Display format of supplementary status information when "SUB STATUS" is set to "ALL"

All items of supplementary status information are displayed in the order shown below.


(Example)
V1234T DC IP F
Editing mode settings made on the editing controller
Operating mode of the internal time code generator
Recording format of the tape being played back

Connections for a Digital Non-Linear Editing System

This unit can be connected to an ES-7 EditStation to configure a digital non-linear editing system.
If you use the QSDI interface, you can transfer video, audio, time code, and other compressed data at quad speed (four times the normal transfer rate) between this unit and the ES-7.
The unit supports ClipLink functions, enabling index pictures recorded on tape and ClipLink log data stored in cassette memory to be transferred to the ES-7 in an instant.

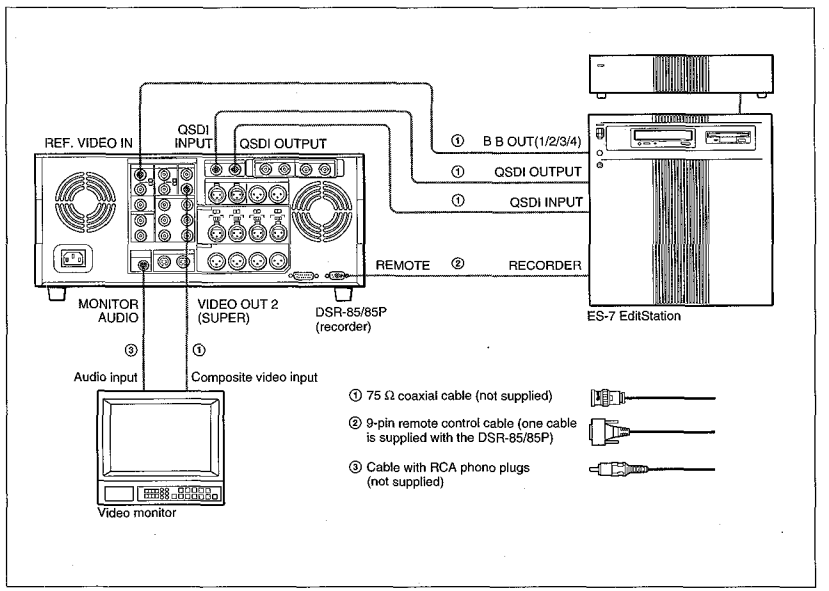
For a general description of ClipLink functions, refer to "ClipLink™ Guide" supplied with the unit.

The following figure shows a connection diagram for non-linear editing system in which this unit serves as the recorder.

For connections of the ES-7 and its peripheral devices such as the ESBK-7011 Control Panel, the ESBK-7045 Disk Unit, etc., refer to your ES-7 Operating Instructions.

Note

The example connections shown in this chapter assume that DSR-85/85P, DSR-80/80P, and DSR-60/60P units have DSBK-100/110/120/130 (or DSBK-100P/110P/120P/130P) option boards installed.



Settings on the DSR-85/85P

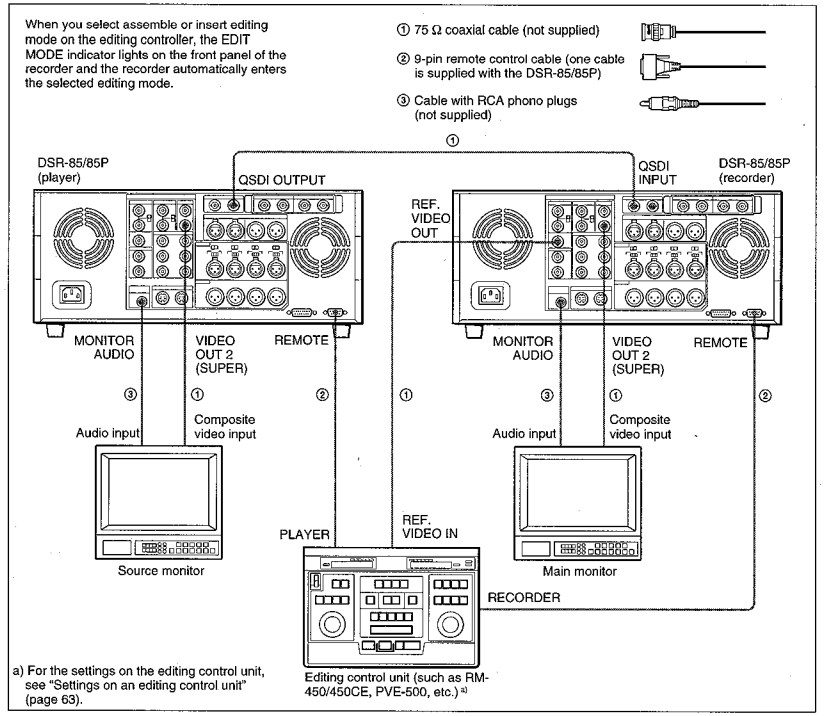
Switch	Setting
REMOTE/LOCAL	REMOTE
REF. VIDEO IN 75 Ω termination	ON

For details of video/audio input and audio mode settings, see "Settings for Recording" (page 19).

Connections for a Cut Editing System

The following figure shows a cut editing system configuration that includes two DSR-85/85Ps to serve as the player and recorder.

For details of connecting devices other than the DSR-85/85Ps, refer to the instruction manual for each device.


When you select assemble or insert editing mode on the editing controller, the EDIT MODE indicator lights on the front panel of the recorder and the recorder automatically enters the selected editing mode.
① 75 Ω coaxial cable (not supplied)
② 9-pin remote control cable (one cable is supplied with the DSR-85/85P)
③ Cable with RCA phono plugs (not supplied)
DSR-85/85P (player)
QSDI OUTPUT
QSDI INPUT
DSR-85/85P (recorder)
REF. VIDEO OUT
MONITOR AUDIO
VIDEO OUT 2 (SUPER)
REMOTE
Audio input
Composite video input
Source monitor
Main monitor
PLAYER
REF. VIDEO IN
RECORDER
Editing control unit (such as RM-450/450CE, PVE-500, etc.) a)
a) For the settings on the editing control unit, see "Settings on an editing control unit" (page 63).

Settings on the DSR-85/85Ps (recorder and player)

Switch	Recorder	Player
REMOTE/LOCAL	REMOTE	REMOTE

For details of the video/audio input and audio mode settings for the recorder, see "Settings for Recording" (page 19).

Note

Jog audio monitoring is not possible with the recorder and its monitor. For this purpose use the player and its monitor.

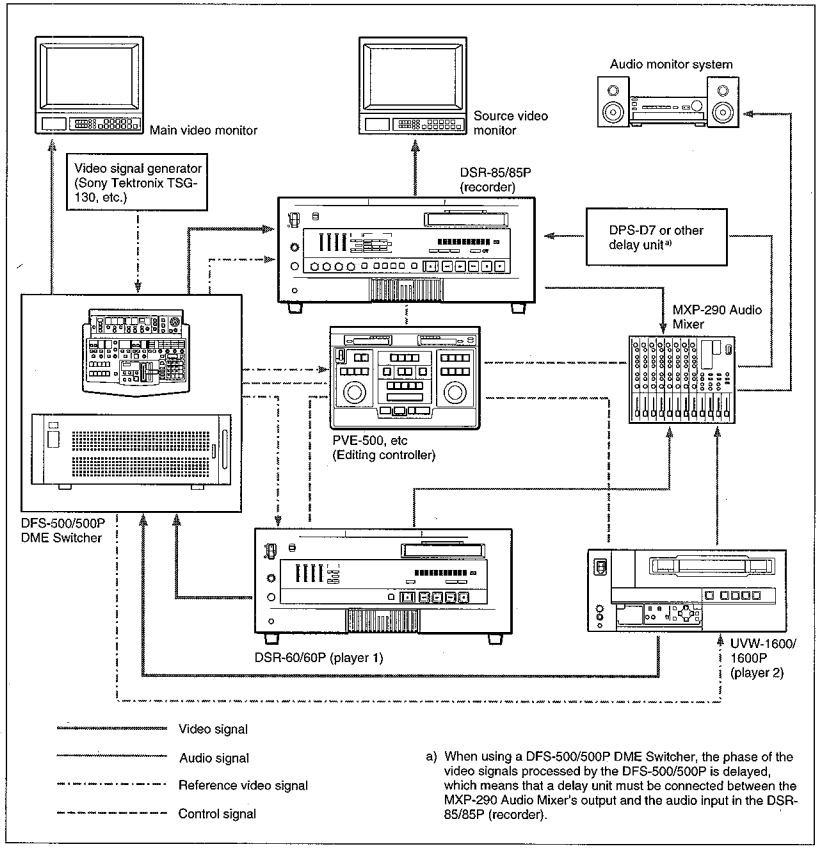
About reference video signals

In order to provide stable video and audio signals for analog editing, it is necessary for the built-in time base corrector (TBC) to operate correctly. To ensure this, input a reference video signal synchronized with the video signal to the REF. VIDEO IN connector and set the REF. VIDEO IN 75Ω termination switch to ON.

Connections for an A/B Roll Editing System

The following is an example configuration of A/B roll editing system using the DSR-85/85P.
In this configuration, the recorder is a DSR-85/85P, player 1 is a DSR-60/60P, and player 2 is an analog Betacam UVW-1600/1600P Videocasette Player. To create a final tape (a tape that contains a completely packaged program) in Betacam format, you can use a Betacam VCR such as the UVW-1800/1800P as the recorder.

The purpose of the following figure is to clearly indicate the flow of signals among the component devices in this system. The specific connections and DSR-85/85P settings for this system are described beginning on the next page.

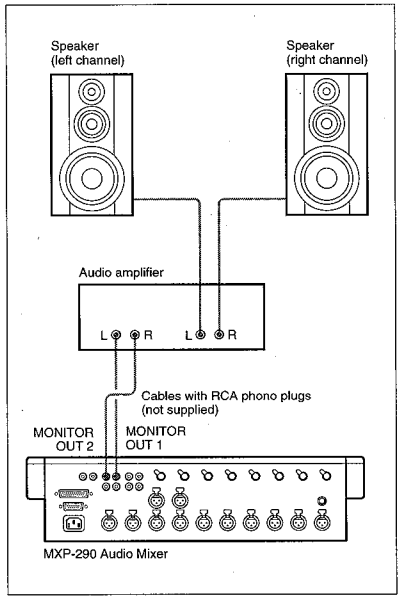

Main video monitor
Source video monitor
Audio monitor system
Video signal generator (Sony Tektronix TSG-130, etc.)
DSR-85/85P (recorder)
DPS-D7 or other delay unit a)
MXP-290 Audio Mixer
PVE-500, etc (Editing controller)
DFS-500/500P DME Switcher
DSR-60/60P (player 1)
UVW-1600/1600P (player 2)
Video signal
Audio signal
Reference video signal
Control signal
a) When using a DFS-500/500P DME Switcher, the phase of the video signals processed by the DFS-500/500P is delayed, which means that a delay unit must be connected between the MXP-290 Audio Mixer's output and the audio input in the DSR-85/85P (recorder).

Connections for an A/B Roll Editing System

Audio monitor system connections

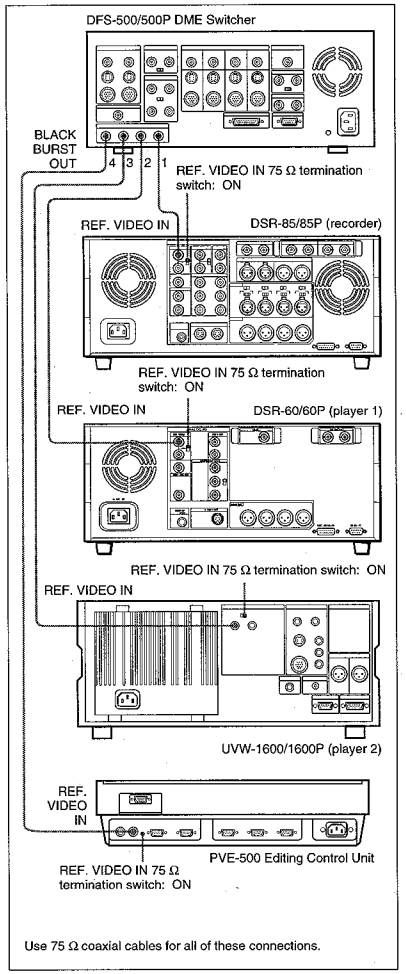
The following shows an example of audio monitor system connections.

For details of these connections, refer to each connected device's instruction manual.



Reference video signal connection

When you perform editing, be sure to use a reference video signal.



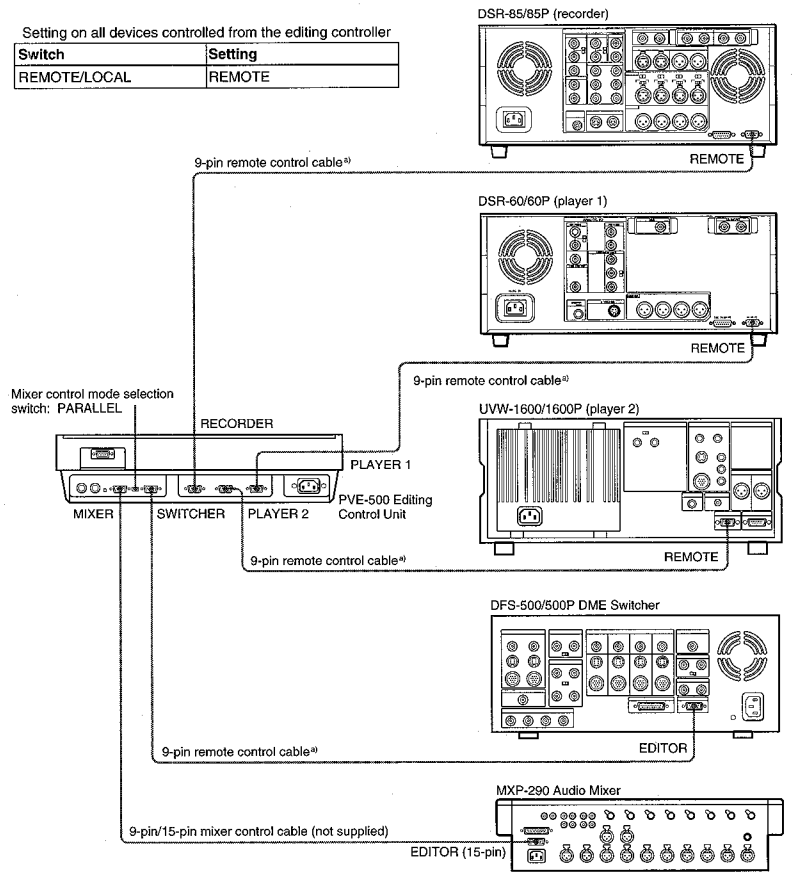
Use 75 Ω coaxial cables for all of these connections.

Control signal connections

The following shows an example of control signal connections to enable the editing controller to control all other A/B roll editing system devices.

Setting on all devices controlled from the editing controller

Switch	Setting
REMOTE/LOCAL	REMOTE

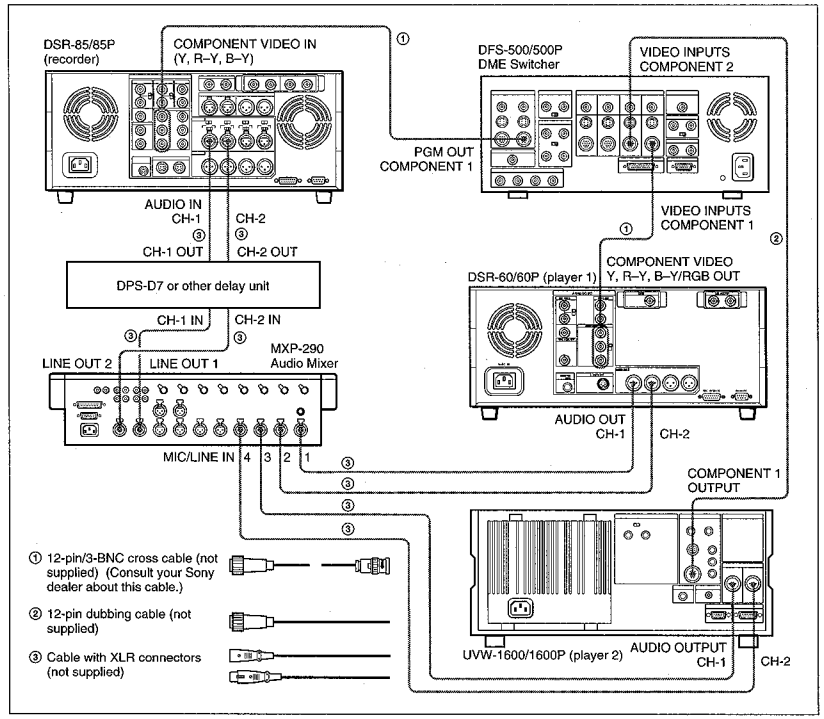


a) Use the 9-pin remote control cable supplied with this unit or an optional RCC-5G/10G/30G cable.

Connections for an A/B Roll Editing System

Video/audio signal connections

The following shows an example of video/audio signal connections in an A/B roll editing system. In this example, analog component signals are used as the video signals and XLR 3-pin connectors are used as audio input/output connectors.



Settings on the DSR-85/85P (recorder)

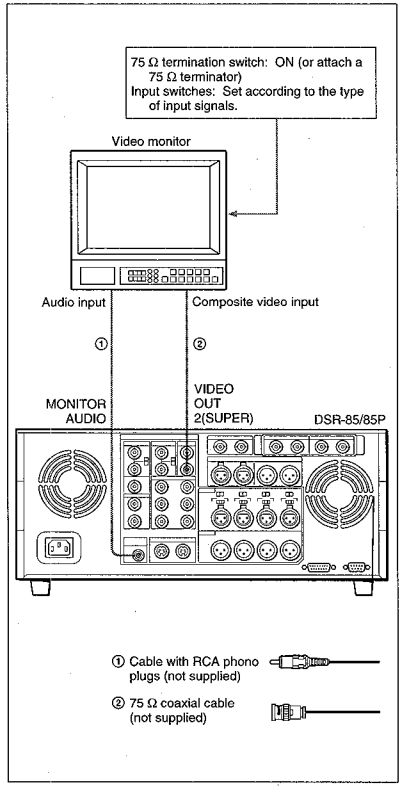
Switch	Setting
AUDIO IN 600 Ω ON/OFF	ON
AUDIO IN –6dBm/0dBm/+4dBm	Normally +4dBm

For details of the video/audio input and audio mode settings, see "Settings for Recording" (page 19).

Connection of a video monitor

Set up the following connections to enable monitoring of video and audio signals on a video monitor. In addition to video signals, you can have time data, the DSR-85/85P's operation mode, alarm messages, and other information displayed as text on the monitor screen by setting "CHARA. DISPLAY" under the DISPLAY CONTROL menu item to "ON" (this is the factory default setting).

For details of menu operations, see Chapter 4.



Settings on an editing control unit

When connecting an editing control unit, make the settings as follows, according to the model.

PVE-500

No settings are required.

BVE-600/900/910/2000 (NTSC model) or FXE-100/120

Set the VCR constants as follows.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
80	10	00	96	05	05	03	80	0A	08	FE	00	80	5A	FF

BVE-600/900/910/2000 (PAL model) or FXE-100P/120P

Set the VCR constants as follows.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
81	10	00	7D	05	05	02	80	0A	07	FE	00	80	4C	FF

RM-450/450CE

Set the DIP switches as follows.

• **Left switches**

7	6	5	4	3	2	1	0
OFF	–	–	OFF	–	–	–	–

• **Right switches (RM-450)**

7	6	5	4	3	2	1	0
OFF	–	OFF	ON	OFF	OFF	ON	ON

• **Right switches (RM-450CE)**

7	6	5	4	3	2	1	0
ON	–	OFF	ON	OFF	OFF	ON	ON

BVE-800

Set the DIP switches as follows.

• **SW2**

1	2	3	4	5	6	7	8
ON	OFF	ON	ON	–	ON	ON	–

• **SW3 (NTSC model)**

1	2	3	4	5	6	7	8
OFF	ON	OFF	ON	–	ON	OFF	OFF

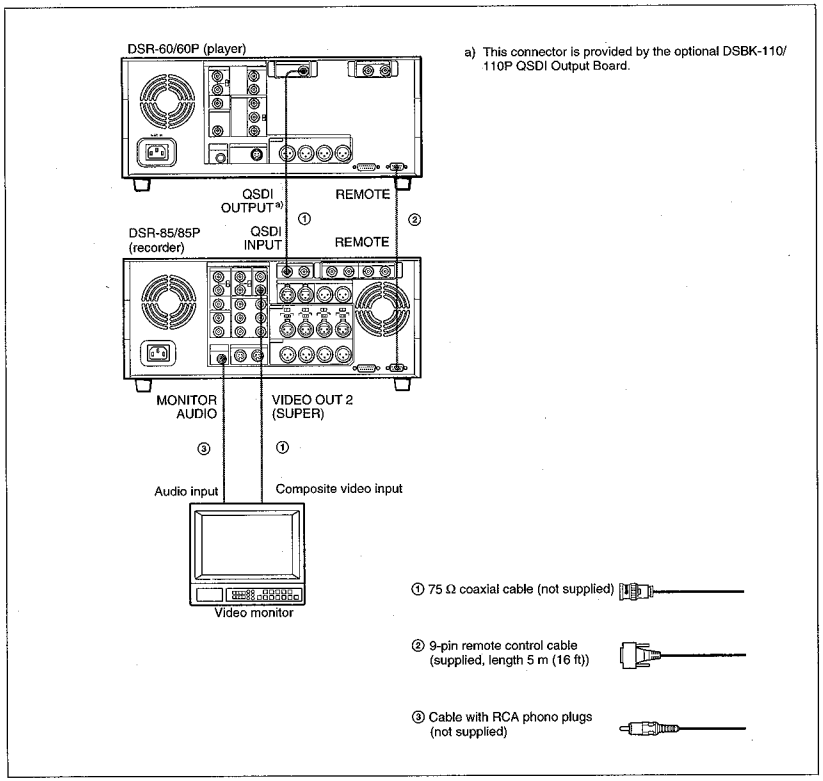
• **SW3 (PAL model)**

1	2	3	4	5	6	7	8
ON	ON	OFF	ON	–	ON	OFF	OFF

Connections for QSDI Dubbing

The following shows an example of connections for QSDI dubbing *(see page 38)*, with the DSR-85/85P used as the recorder and a DSR-60/60P as the player.

(Using a DSR-60/60P for QSDI dubbing requires an optional DSBK-110/110P QSDI Output Board.)

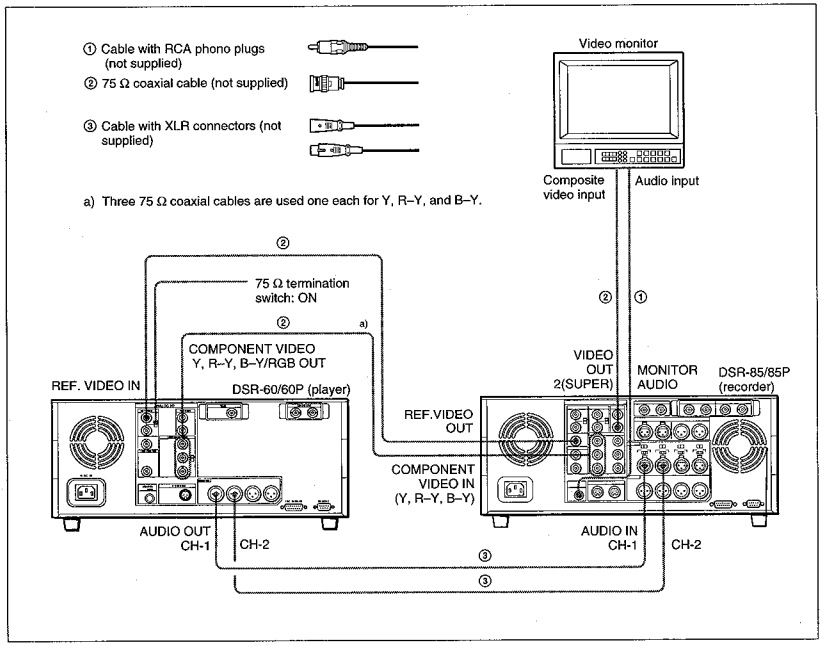

DSR-60/60P (player)
a) This connector is provided by the optional DSBK-110/110P QSDI Output Board.
QSDI OUTPUT a)
REMOTE
DSR-85/85P (recorder)
QSDI INPUT
REMOTE
MONITOR AUDIO
VIDEO OUT 2 (SUPER)
Audio input
Composite video input
Video monitor
① 75 Ω coaxial cable (not supplied)
② 9-pin remote control cable (supplied, length 5 m (16 ft))
③ Cable with RCA phono plugs (not supplied)

DSR-85/85P (recorder) and DSR-60/60P (player) settings

Switch	Recorder	Player
REMOTE/LOCAL	LOCAL	REMOTE

Connections for Analog Recording

The following shows connections for a system in which analog playback signals from another recorder or player are recorded on a DSR-85/85P. In this system, the video signals are analog component signals and the audio signals are recorded from audio channels 1 and 2.


① Cable with RCA phono plugs (not supplied)
② 75 Ω coaxial cable (not supplied)
③ Cable with XLR connectors (not supplied)
a) Three 75 Ω coaxial cables are used one each for Y, R–Y, and B–Y.
Video monitor
Composite video input
Audio input
75 Ω termination switch: ON
COMPONENT VIDEO Y, R–Y, B–Y/RGB OUT
REF. VIDEO IN
DSR-60/60P (player)
REF.VIDEO OUT
COMPONENT VIDEO IN (Y, R–Y, B–Y)
VIDEO OUT 2(SUPER)
MONITOR AUDIO
DSR-85/85P (recorder)
AUDIO OUT CH-1
CH-2
AUDIO IN CH-1
CH-2

Settings on the DSR-85/85P

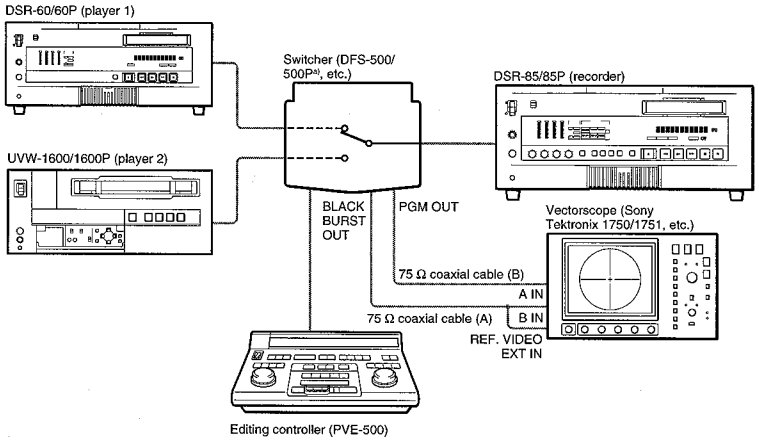
Switch/input/audio mode	Setting
REMOTE/LOCAL	REMOTE (when controlling the unit from an editing controller)
AUDIO IN 600 Ω ON/OFF	ON
AUDIO IN –6 dBm/0 dBm/ +4 dBm	Normally +4 dBm
Video input	Component
Audio input	Analog
Audio mode	2-channel (48 kHz)

For details of the video/audio input and audio mode settings, see "Settings for Recording" (page 19).

Adjusting the Sync and Subcarrier Phases

When using two or more players, as in an A/B roll editing system, phase synchronization of the signals (i.e. system sync) is necessary and for composite signals, the subcarrier phase must also be in sync. If not, picture instabilities or color break-up may occur at edit points.

After configuring the editing system, use a vectorscope to adjust the sync and subcarrier phase of the recorder and players. Subcarrier phase adjustment is necessary when using composite signals.



a) The sync and subcarrier phase of the output signal from the DFS-500/500P switcher are automatically adjusted.

Note

Ensure that the 75 Ω coaxial cables (A) and (B) are of the same length.

Performing a phase adjustment operation

1 Press the SCH button on the vectorscope.

The vectorscope switches to "SCH" mode.

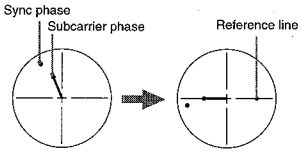
2 Press the B channel button on the vectorscope.

This displays the black burst signal from the switcher.

3 Press the EXT button on the vectorscope.

This switches the vectorscope to external synchronization mode.

4 Adjust the phase synchronization control on the vectorscope so that the sync and subcarrier phases are close to the reference line.



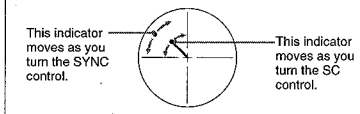
Align the sync and subcarrier phase of the black burst signal to the reference line.

5 Output the player 1 signal from the PVE-500.

6 Press the A channel button on the vectorscope.

This displays the sync phase and subcarrier phase (composite signals only) of the signal from player 1.

7 On player 1, adjust the SYNC and SC controls, using a Phillips screwdriver, so that the output from player 1 on channel (A) is in correct phase alignment with the black burst signal on channel (B).



Adjust the sync and subcarrier phase of the output signal from player 1.

Note

When component signals are used the subcarrier phase indicator does not appear.

8 Output the player 2 signal from the PVE-500, and repeat steps **6** and **7** to adjust the sync and subcarrier phase of the output from player 2.

Maintenance

Condensation

If you move the unit suddenly from a cold to a warm location, or if you use it in a very humid place, moisture from the air may condense on the head drum. This is called condensation, and if a tape is run in this state, the tape may stick to the drum and can be easily damaged. To lessen the risk of this occurring, this unit is equipped with a condensation detection system.

If condensation occurs while the unit is operating:
The alarm message "MOISTURE HAS BEEN DETECTED." appears on the monitor screen, and the alarm message "HUMID!" on the time counter display. At the same time the unit ejects the cassette automatically. If this happens, leave the unit's power on and wait until the alarm messages disappear.

If the condensation alarm message appears immediately after powering on:
Leave the unit powered on and wait until the alarm message disappears. You cannot load a cassette into the unit while the alarm message is being displayed. Once the alarm message disappears, the unit is ready for use.

Regular Checks

Digital hours meter

The digital hours meter keeps cumulative counts of the total operating time, the head drum rotation time, the tape transport operating time, and the number of threading/unthreading operations. These counts can be displayed on the monitor screen and the time counter display of this unit. Use them as guidelines for scheduling maintenance.
In general, consult your Sony dealer about necessary periodic maintenance checks.

Digital hours meter display modes
The digital hours meter has the following four display modes.
- **T1 (OPERATION) mode**
  The cumulative total hours during which the unit is powered on is displayed in 10-hour increments.
- **T2 (DRUM ROTATION) mode**
  The cumulative total hours of drum rotation with tape threaded is displayed in 10-hour increments.
- **T3 (TAPE RUNNING) mode**
  The cumulative total hours of tape transport operation is displayed in 10-hour increments.
- **CT (THREADING) mode**
  The cumulative number of tape threading/unthreading operation pairs is displayed in 10-operation pair increments.

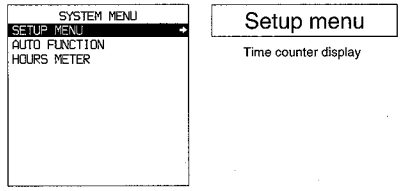
For all modes except T1 (OPERATION), there are two types of count: a "trip" count, which is resettable, and the cumulative total from manufacture, which is unresettable.

Displaying the digital hours meter

1 Press the MENU button on the menu control panel.

The menu selection level display appears on the monitor screen and the time counter display.

Menu selection level display

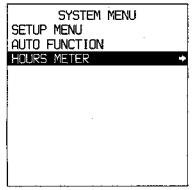


Monitor screen

Time counter display

(Continued)

2 Press the ⇩ button to select "HOURS METER".



Monitor screen

Hours meter

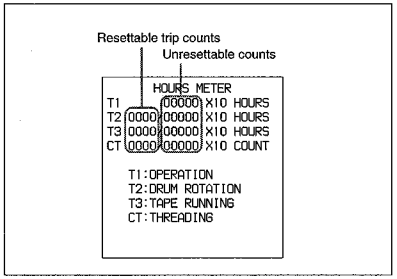
Time counter display

3 Press the ⇨ button.

The cumulative counts by the digital hours meter are indicated on the monitor screen and the time counter display.

Digital hours meter indications on the monitor screen

All four counts (T1, T2, T3, and CT) are indicated on the monitor screen.



The four-digit value to the left of the slash is the resettable trip count, and the right value is the cumulative total from manufacture.

Digital hours meter indications on the time counter display

One of the four indications appears on the time counter display at a time. Use the ⇧ and ⇩ buttons to change the item displayed.

Initially, only the trip value appears. Hold down the ⇨ button to display also the cumulative total from manufacture, which will appear to the right of the trip value and the slash.

The following illustrates the digital hours meter indications on the time counter display in all four display modes. The right-hand indication for each display mode is the indication you can view while holding down the ⇨ button on the menu control panel.

T1 (OPERATION) mode:

Oper. 00000	

T2 (DRUM ROTATION) mode:

Drum 0000	0000/00000

T3 (TAPE RUNNING) mode:

Tape 0000	0000/00000

CT (THREADING) mode:

Thread 0000	0000/00000

To end the digital hours meter display

Press the MENU button on the menu control panel.

Resetting the trip values

About this operation, consult your Sony dealer.

Head Cleaning

Always use the PDVM-12CL Cleaning Cassette to clean the video and audio heads. You can run the cleaning cassette for 10 seconds per cleaning operation. Follow the instructions for the cleaning cassette, as inappropriate use of the cleaning cassette can damage the heads.

To clean the heads

Insert the cleaning cassette. This automatically starts cleaning. You cannot operate any tape transport control buttons other than the EJECT button during the cleaning operation.

After about 10 seconds, the cleaning cassette will be automatically ejected.

Troubleshooting

If an alarm message appears on the monitor screen or the time counter display, or if the unit appears to be malfunctioning, please check the following before contacting your Sony dealer.

Tape problems		
Symptom	**Cause**	**Remedy**
Recording is not possible.	The cassette's REC/SAVE switch is set to SAVE.[a]	Set the REC/SAVE switch to REC.
The unit's tape transport control buttons (PLAY, F FWD, REW, etc.) do not work.	The REMOTE/LOCAL switch is set to REMOTE and "LOCAL ENABLE" under the OPERATIONAL FUNCTION menu item is set to "STOP & EJECT" or "ALL DISABLE".[a]	Set the REMOTE/LOCAL switch to LOCAL and change the menu setting of "LOCAL ENABLE" to "ALL ENABLE". *(See page 42.)*
	No cassette is loaded.[a]	Insert a cassette. *(See page 24.)*
The NOT EDITABLE indicator on the front panel lights up.	The recording mode selected on this unit does not coincides with that of the loaded tape.[a]	• When your current purpose is editing, set the REMOTE/LOCAL switch to LOCAL and set the unit for the same recording mode as with the tape, then reset the REMOTE/LOCAL switch to REMOTE. • When your current purpose is recording, you can use the tape currently loaded in the unit.
	The recording format of the currently loaded tape is "DV".[a]	• If you are using the unit for recording, you can use the currently loaded tape. • You can use the currently loaded tape as a source tape for playback and editing. • You cannot use the tape as a recording tape for editing.

Time data problems		
Symptom	**Cause**	**Remedy**
Cannot freely set the time data's initial value.	"TC MODE" under the TIME CODE menu item has been set to "EXT REGEN".[a]	Change the menu setting of "TC MODE" to "INT PRESET". *(See page 45.)*
	CNT is selected as the time data type to be displayed. (The "COUNTER" time data type indicator is lit.)[a]	Press the COUNTER SELECT button to make the "TC" or "U-BIT" time data type indicator light up.
	The REMOTE/LOCAL switch is set to REMOTE and "LOCAL ENABLE" under the OPERATIONAL FUNCTION menu item is set to "STOP & EJECT" or "ALL DISABLE".[a]	Set the REMOTE/LOCAL switch to LOCAL and change the menu setting of "LOCAL ENABLE" to "ALL ENABLE". *(See page 42.)*
The tape is running, but the time data is not shown in the time counter display.	The MENU button or TC PRESET button on the menu control panel has been pressed.	Press the button once again to exit the menu control mode, time code preset mode, or digital hours meter display mode. (In either of these modes, the time data is not shown in the time counter display.)
	The "U-BIT" time data type indicator is lit.	Press the COUNTER SELECT button to make the "COUNTER" or "TC" time data type indicator light up.

Input problems		
Symptom	**Cause**	**Remedy**
It is not possible to record a QSDI signal.	No QSDI signal is input to the unit.[a]	Connect a QSDI signal to the QSDI INPUT connector.

a) In these states, an alarm message appears on the monitor screen and on the time counter display.

Troubleshooting

Monitor problems		
Symptom	**Cause**	**Remedy**
Data is not superimposed on the monitor screen.	"CHARA. DISPLAY" under the DISPLAY CONTROL menu item is set to "OFF".	Set "CHARA. DISPLAY" to "ON". *(See page 43.)*
	The monitor is not connected to the VIDEO OUT 2 (SUPER) connector of this unit.	Connect the monitor to the VIDEO OUT 2 (SUPER) connector. (You must make this connection to display any type of text on the monitor.)
The image on the monitor's screen is too bright.	The 75 Ω termination switch for video input on the monitor is in the OFF position or a 75 Ω terminator is not fitted to its video input connector.	Set the 75 Ω termination switch to ON or connect a terminator.
The image on the monitor's screen is too dark.	In a video signal loop-through connection of video monitors, 75 Ω termination switches for video input on monitors other than the loop-end monitor are in the ON position.	Set the 75 Ω termination switches to OFF on all monitors other than the loop-end monitor .
The image is too dark when recording a composite video signal.		

Audio problems		
Symptom	**Cause**	**Remedy**
When an AES/EBU, SDI or QSDI digital audio input is selected, the AUDIO INPUT LEVEL control konbs do not work.	"DIGITAL INPUT" under the AUDIO CONTROL menu item is set to "BYPASS".	Set "DIGITAL INPUT" to "VARIABLE". *(See page 47.)* **Note** To be able to perform this operation, it is necessary to set the menu item "MENU GRADE" to "ENHANCED". *(See page 47.)*
When a QSDI signal from a player VCR is selected as the input to this unit, putting the player into jog mode stops this unit from outputting an EE audio signal.	"QSDI AUDIO MON" under the OPERATIONAL FUNCTION menu item is set to "QSDI".	Change the menu setting of "QSDI AUDIO MON" to a setting other than "QSDI", and input an audio signal corresponding to the new setting. *(See page 43.)* **Note** To be able to perform this operation, it is necessary to set the menu item "MENU GRADE" to "ENHANCED". *(See page 47.)*

Editing problems		
Symptom	**Cause**	**Remedy**
Execution of video editing in insert mode causes subcode data recorded on tape other than time code data to disappear from tape.	This phenomenon cannot be avoided with an editing system using this unit as the recorder.	
During audio editing in insert mode, a strange image appears on the video monitor screen like a partial frozen image of a frame immediately before the IN point being mixed in the playback picture.	This phenomenon cannot be avoided with an editing system using this unit as the recorder, but editing itself will be achieved exactly as you have designed.	

Error Messages

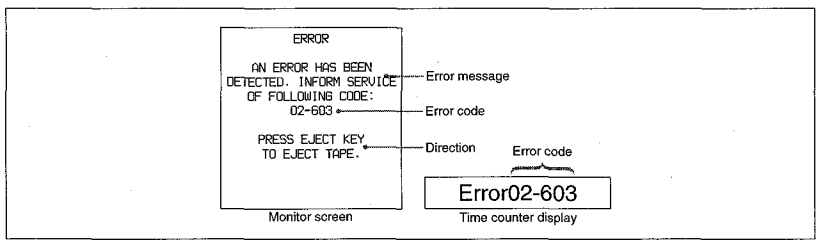
This unit is provided with a self-diagnostic function that detects internal abnormalities. When it detects an abnormality, it outputs an error message to the monitor screen and indicates an error code in the time counter display.

If an error message appears, follow the direction indicated under the message in the monitor screen.

Note

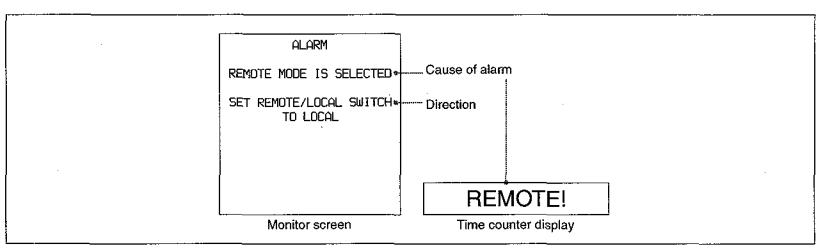
To display error messages on the monitor screen, it is necessary for the monitor to be connected to the VIDEO OUT 2 (SUPER) connector, and for "CHARA. DISPLAY" under the DISPLAY CONTROL menu item to be set to "ON" (factory default setting).

For details of menu settings, see Chapter 4.



Alarm Messages

When a setting, connection or operation error has been made, or when a problem such as condensation on heads has occurred, the unit outputs alarm messages such as the ones shown below to the monitor screen and the time counter display.



If an alarm message appears, follow the direction indicated under the message in the monitor screen.

Note

To display alarm messages on the monitor screen, it is necessary for the monitor to be connected to the VIDEO OUT 2 (SUPER) connector, and for "CHARA. DISPLAY" and "ALARM" under the DISPLAY CONTROL menu item to be set to "ON" (factory default setting) and "REF. ALARM" to be set to"ON" or "ON (LIMITED)" (factory default setting).

For details of menu settings, see Chapter 4.

List of alarm messages and associated directions

Here is a list of alarm messages and associated directions to appear on the monitor screen. It also shows the corresponding alarm messages to appear on the time counter display of this unit.

In this list the "Causes" of alarm are arranged in alphabetic order of the first word of their phrases.

Alarm messages and associated directions

Alarm message on monitor screen / Cause	Direction	Alarm message on time counter display
A black/white signal is being used for REF. VIDEO.	Supply a color signal when using composite or S-video output signals.	B&W REF!
A cleaning tape has been inserted.	The tape will automatically be ejected after cleaning is completed.	Cleaning Tp
A non-standard ref. signal is being used for REF. VIDEO.	Use a standard signal.	REF NON-STD
Abnormal settings selected in setup menu.	Correct the setup menu settings. Contact your Sony dealer if this alarm message appears again after making corrections.	ILL. SETUP
Audio not editable on this tape.	Use a tape recorded in 2-channel (48 kHz) or 4-channel (32 kHz) mode.	2CH/32kHz!
		Fs 44.1kHz!
	Use a tape having audio signals recorded in locked mode.	UNLOCK mode
Audio REC mode selection different from audio on tape.	Select the same audio recording mode as that of the tape.	A mode err
Audio REC (recording) mode cannot be changed during recording.	—	REC mode!
Audio REC (recording) mode cannot be changed in PB (playback) mode.	Enter the unit into EE mode.	PB mode!
Counter mode is selected.	Use the COUNTER SELECT button to make the TC or U-BIT indicator light.	CNT mode!
Input selection cannot be changed in REC (recording) mode.	—	REC mode!
Input selection cannot be changed in ×4 mode.	—	×4 mode!
Input signal does not conform to DVCAM/DV format.	—	Unknown Sig
Input signal is 625/50.	—	625/50 sig!
Input signal is 525/60.	—	525/60 sig!
Input signal is not ×1 mode.	Use normal-speed playback mode.	not ×1 sig!
Input signal is not ×4 mode.	Use quadruple-speed playback mode.	not ×4 sig!
Input video is not detected.	Check the INPUT MODE VIDEO indicators for current video selection, and supply an appropriate video signal.	No INPUT!

(Continued)

Alarm messages and associated directions (Continued)

Alarm message on monitor screen / Cause	Direction	Alarm message on time counter display
Key is jammed.	Check the following buttons: EJECT, STOP, F FWD, REW, PLAY, REC, ⇧, ⇩, ⇦, ⇨, SET (YES), TC PRESET, MENU, RESET (NO), INPUT SELECT (VIDEO, AUDIO CH-1 CH-1/2, AUDIO CH-2 CH-3/4, QSDI), COUNTER SELECT, AUDIO REC SELECT	Key jammed!
Moisture has been detected.	Keep the power on and wait until this alarm message disappears.	HUMID!
No cassette in VTR.	Load a cassette.	No Cass.!
Record inhibit plug on the cassette is set to inhibit.	Set the REC/SAVE switch on the cassette to REC.	REC INHI.!
Remote mode is selected.	Set the REMOTE/LOCAL switch to LOCAL.	REMOTE!
Tape cannot be replayed.	Use a tape having signals recorded in 525/60 format.	625/50 Tape
	Use a tape having signals recorded in 625/50 format.	525/60 Tape
Tape end has been detected.	Use a new cleaning tape.	Tape end!
Tape not editable.	Use a tape recorded in DVCAM format.	Not DVCAM!
	Use a tape having signals recorded in 525/60 format.	625/50 Tape
	Use a tape having signals recorded in 625/50 format.	525/60 Tape
Tape not usable.	Use DVCAM/DV ME (metal-evaporated) tape.	MP Tape!
		ILL. Tape!
TC EXTERNAL is selected.	Use the setup menu to set "TC MODE" to "INT PRESET".	TC EXT!
TCG REGEN mode is selected.	Use the setup menu to set "TC MODE" to "INT PRESET".	REGEN mode!
TCG RUN mode is set to REC RUN.	Use the setup menu to set "RUN MODE" to "FREE RUN".	REC RUN!

Notes on Use

Operation and storage locations
Avoid operation or storage in any of the following places.
- Location subject to extremes of temperature (operating temperature range 5°C to 40°C (41°F to 104°F))
- Location subject to direct sunlight for long periods, or close to heating appliances (Note that the interior of a car left in summer with the windows closed can exceed 50°C (122°F).)
- Damp or dusty places
- Location subject to severe vibrations
- Location near equipment generating strong electromagnetic emissions
- Location near transmitting stations generating strong radio waves

Operate the unit in a horizontal position
This unit is designed to be operated in a horizontal position. Do not operate it on its side, or tilted through an excessive angle (exceeding 20°).

Avoid violent impacts
Dropping the unit, or otherwise imparting a violent shock to it, is likely to cause it to malfunction.

Do not obstruct ventilation opening
To prevent the unit from overheating, do not obstruct ventilation openings, by for example wrapping the unit in a cloth while it is in operation.

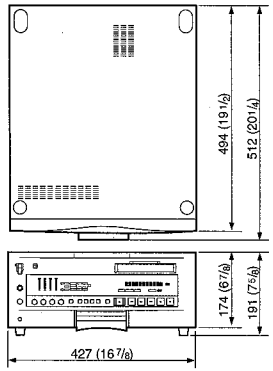
Care
If the casing or panel is dirty, wipe it gently with a soft dry cloth. In the event oôPextreme dirt, use a cloth steeped in a natural detergent to remove the dirt, then wipe with a dry cloth. Applying alcohol, thinners, insecticides, or other volatile solvents may result in deforming the casing or damaging the finish.

Shipping
Pack the unit in its original carton or equivalent packing, and take care not to impart violent shocks in transit.

Specifications

General

Signal system
DSR-85: NTSC
DSR-85P: PAL
Power requirements
DSR-85: 120 V AC, 50/60 Hz
DSR-85P: 220 to 240 V AC, 50/60 Hz
Power consumption
185 W
Operating temperature
5°C to 40°C (41°F to 104°F)
Storage temperature
–20°C to +60°C (–4°F to +140°F)
Operating relative humidity
Less than 80%
Storage relative humidity
Less than 90%
Mass 21 kg (46 lb 4 oz)
Dimensions (w/h/d, excluding projections)
427 × 174 × 494 mm
(16 7/8 × 6 7/8 × 19 1/2 inches)



Unit: mm (inches)

Tape transport control system

Tape speed
DSR-85: 28.193 mm/s
DSR-85P: 28.221 mm/s
Recording/playback time
Using PDV-184ME standard-size cassette:
Maximum 184 minutes
Using PDVM-40ME mini-size cassette:
Maximum 40 minutes
Fast forward/rewind time
Using PDV-184ME standard-size cassette:
Less than 3 minutes
Using PDVM-40ME mini-size cassette:
Less than 1 minute
Search speed
When controlling via RS-422A interface:
Maximum 85, 32, or 16 times normal in both directions (according to the menu setting)
Video search (color): Up to 32 times normal speed in both directions
Audio search: Ranging from 2 times to 1/30 normal speed
When controlling from optional DSRM-10/SVRM-100A:
Jog mode: 0 (still) to 2 times normal in both directions
Shuttle mode: 8 speeds from 0 (still) to 16 times normal in both directions
Digital slow mode: 3 speeds, (0 (still), 1/5, 1/10 normal in both directions)

Video performance

Bandwidth (when using analog component interface)
DSR-85: Y: 5.0 MHz +1.0 dB/–1.0 dB
R–Y, B–Y: 1.5 MHz +1.0 dB/–5.0 dB
DSR-85P: Y: 5.5 MHz +1.0 dB/–2.0 dB
R–Y, B–Y: 2.0 MHz +1.0 dB/–2.0 dB
S/N(when using analog component interface)
More than 55 dB
K-factor (K2T, KPB)
Less than 2.0%
Y/C delay Less than 30 ns

Audio performance

Frequency response
2-channel (FS=48 kHz) mode:
20 Hz to 20 kHz +0.5 dB/–1.0 dB
4-channel (FS=32 kHz) mode:
20 Hz to 14.5 kHz +0.5 dB/–1.0 dB
Dynamic range More than 85 dB
Distortion (THD + N)
Less than 0.05% (FS=48 kHz)

Input connectors

Digital signal inputs

QSDI INPUT BNC type, QSDI format (270 Mbps)
SDI INPUT (with optional DSBK-120/120P SDI Input/Output Board installed)
BNC type (×2, active-through), Serial Digital Interface format (270 Mbps), SMPTE 259M/CCIR656-III

Analog video inputs

REF. VIDEO IN BNC type (×2, loop-through), black burst, 0.286 Vp-p, 75 Ω, sync negative
VIDEO IN BNC type (×2, loop-through), composite, 1.0 Vp-p, 75 Ω, sync negative
COMPONENT VIDEO IN
BNC type (×3), component
Y: 1.0 Vp-p, 75 Ω, sync negative
R–Y, B–Y: 0.7 Vp-p, 75 Ω (75%)
S VIDEO IN DIN 4-pin
Y: 1.0 Vp-p, 75 Ω
C: 0.286 Vp-p, 75 Ω (DSR-85)
0.3 Vp-p, 75 Ω (DSR-85P)

Analog audio inputs

AUDIO IN XLR 3-pin, female (×4), +4/0/–6 dBu, 600 Ω (with 600 Ω ON/OFF switch set to ON), 10 kΩ (with switch OFF), balanced

Digital audio inputs

DIGITAL AUDIO (AES/EBU) INPUT
XLR 3-pin, female (×2), 110 Ω, balanced

Time code input

TIME CODE IN (with optional DSBK-130/130P Time Code Input/Output Board installed)
BNC type, SMPTE time code (DSR-85), EBU time code (DSR-85P), 0.5 Vp-p to 18 Vp-p, 3.3 kΩ, unbalanced

Output connectors

Digital signal outputs

QSDI OUTPUT BNC type, QSDI format (270 Mbps)
SDI OUTPUT (with optional DSBK-120/120P SDI Input/Output Board installed)
BNC type (×2, active-through), Serial Digital Interface format (270 Mbps), SMPTE 259M/CCIR656-III

Analog video outputs

REF. VIDEO OUT
BNC type, composite sync, 0.286 Vp-p, 75 Ω, sync negative (with burst)
VIDEO OUT 1, 2 (SUPER)
BNC type (×2), composite, 1.0 Vp-p, 75 Ω, sync negative
COMPONENT VIDEO OUT
BNC type (×3), component
Y: 1.0 Vp-p, 75 Ω, sync negative
R–Y, B–Y: 0.7 Vp-p, 75 Ω (75%)
S VIDEO OUT DIN 4-pin, Y and C separated
Y: 1.0 Vp-p, 75 Ω
C: 0.286 Vp-p, 75 Ω (burst level) (DSR-85)
0.3 Vp-p, 75 Ω (burst level) (DSR-85P)

Specifications

Analog audio outputs

AUDIO OUT XLR 3-pin, male (× 4), +4 dBu, 600 Ω loading, low impedance, balanced

MONITOR AUDIO Phono jack, –6 dBu +1 dBu/–1 dBu 47 kΩ, unbalanced

Digital audio outputs

DIGITAL AUDIO (AES/EBU) OUTPUT XLR 3-pin, male (×2), 110 Ω, balanced

Output for headphones

HEADPHONES Stereo phone jack, –16 dBu +2 dBu/–2 dBu, 8 Ω, unbalanced

Time code output

TIME CODE OUT (with optional DSBK-130/130P Time Code Input/Output Board installed) BNC type, SMPTE time code (DSR-85), EBU time code (DSR-85P), 2.2 Vp-p +3 dBu/–3 dBu, 600 Ω, unbalanced

Remote control connectors

REMOTE D-sub 9-pin, for connection of editing controller[1], RS-422A standard

CONTROL S Stereo minijack, for connection of SIRCS-system remote control unit (SVRM-100A, DSRM-10)

TBC REMOTE D-sub 15-pin, for connection of TBC remote controller[2]

Accessories supplied

AC power cord (1)
RCC-5G 9-pin remote control cable (1)
Operating Instructions (1)
ClipLink™ Guide (1)

Optional accessories

DSBK-120/120P SDI Input/Output Board
DSBK-130/130P Time Code Input/Output Board
RCC-5G/10G/30G 9-pin remote control cable (length 5 m (16 ft)/10 m (33 ft)/30 m (98 ft))
RMM-130 Rack Mount Kit
Digital video cassette
Standard size: PDV-64ME/94ME/124ME/184ME
Mini size: PDVM-12ME/22ME/32ME/40ME
PDVM-12CL Cleaning Cassette

Related equipment

ES-7 EditStation
Linear editing controller (PVE-500, RM-450/450CE, BVE-600/800/910/2000/9100/9100P, etc.)
DFS-500/500P DME Switcher
DXC-D30/D30P Color Video Camera
Digital Videocassette Recorder DSR-1/1P
Digital Videocassette Recorder DSR-80/80P
Digital Videocassette Player DSR-60/60P
Digital Camcorder DSR-130/130P
DSRM-10 Remote Control Unit
SVRM-100/100A Remote Control Unit
TBC remote controller (UVR-60/60P, BVR-50/50P)

Design and specifications are subject to change without notice.

1) ES-7, PVE-500, RM-450/450CE, BVE-600/800/910/2000/9100/9100P, etc.
2) UVR-60/60P, etc.

Glossary

A/B roll editing
An editing method that uses two or more playback VCRs to create special effects such as dissolve and wipe, and uses one record VCR to record the results of the editing. Using an editing controller allows efficient control of the VCRs and very precise editing.

B–Y signal
A chrominance signal determined by subtracting the Y (luminance) signal from the B (blue) signal. One of the component signals.

Capstan
A drive mechanism that moves the tape at a specified speed. Its rotation normally synchronizes with a reference sync signal.

Chrominance signal
Color signal containing color information such as hue and saturation. Also called C signal.

Component signal
A video signal consisting of a luminance signal (Y) and two chrominance signals (R–Y, B–Y).

Composite signal
A composite video signal containing video, burst and sync signals.

Condensation
Condensation of moisture on the tape transport mechanisms of VCRs including the head drum. If moisture condenses on the head drum, the tape adheres to the drum and causes malfunction.

Drop frame mode
In NTSC format, the actual number of frames per second is approximately 29.97, while that for SMPTE time code is specified as 30. Drop frame mode is a mode in which time code is advanced in such a way that the difference in frame value between real time and time code is corrected. In this mode, two frames are skipped at the beginning of each minute, except for every tenth minute, so that the frame value for time code matches that for real time. *See also* "Non-drop frame mode".

EBU
European Broadcasting Union. Established by broadcasting and related organizations in Europe.

EE mode
EE is an abbreviation of "Electric to Electric". Video and audio signals are supplied to the VCR's internal circuits, but not to the recording heads.

Linear editing
Editing while playing back video and audio signals recorded on video tape. *See also* "Non-linear editing".

Loading
When being loaded, the tape is pulled out of the cassette case and threaded along the specified tape path and wrapped round the drum to be ready for recording or playback. Generally, this is done automatically when you place the cassette at the cassette entrance of the VCR. Also called threading.

Loop-through connection
A connection which allows a signal input to an input connector to pass through the unit and exit from an output connector as input to external equipment. Also called bridging connection.

Luminance signal
The signal that determines the brightness of the picture. Also called Y signal. One of the component signals.

Non-drop frame mode
A mode of advancing time code in such a way that the difference in frame value between real time and time code is neglected. Using this mode produces a difference of approximately 86 seconds per day between real time and time code, which causes problems when editing programs in units of seconds using the number of frames as a reference.

Non-linear editing
Editing while playing back video and audio signals recorded on hard disks. Video scenes stored on disk can be cued up quickly, for increased editing efficiency. *See also* "Linear editing".

R–Y signal
A chrominance signal determined by subtracting the Y (luminance) signal from the R (red) signal. One of the component signals.

Reference video signal
A video signal consisting of a sync signal or sync and burst signals, used as a reference.

SMPTE
Society of Motion Picture and Television Engineers.

S/N
Abbreviation of Signal-to-Noise (ratio). The higher the S/N value, the less noise and higher the picture quality.

Search mode
A VCR operating mode used when searching for specific scenes, by viewing the video output or time code values while playing back the tape at various speeds in forward or reverse direction.

Servo lock
Synchronizing the drum rotation phase and tape transport phase with a reference signal during playback and recording so that the video heads scan the tape in the same pattern during playback and recording.

Standby Off mode
One of two conditions in the stop mode. The drum does not rotate and tape is slackened. There is no damage to the video heads and the tape, but the VCR is not ready for immediate recording or playback.

Standby On mode
One of two conditions in the stop mode. The drum is rotating and the tape is wrapped round the drum. The VCR is ready for recording or playback, so a still picture can be obtained.

Subcarrier
A sine wave imposed on the luminance portion of a video signal and modulated to carry color information. Its amplitude represents color saturation and its phase, hue.

Superimpose
To put a set of characters onto a picture so that both can be seen at the same time.

Glossary

S-video
A signal format in which Y (luminance) and C (chrominance) signals are separated to reduce interference between them so that noiseless images are reproduced.

Sync signal
A reference signal consisting of vertical and horizontal sync signals used for synchronizing the scanning patterns of the video camera and the monitor.

TBC
Abbreviation of Time Base Corrector. Electronic circuits to electrically stabilize the playback signals by removing color variation and roll in the playback picture caused by irregularity in drum rotation and tape movement. Time base correction reduces deterioration of picture quality when transmitting or copying playback signals.

Threading
See "Loading".

Time code
Signals recorded on the tape to supply information on tape position such as the hour, minute, second and frame, to assist in setting edit points or searching for particular scenes.

User bits
Sections of time code information consisting of a total of 32 bits that can be used for recording information such as date, tape ID number, program ID number, etc.

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SECTION 2
INSTALLATION

Be sure to install the DSR-85/85P in location satisfying the required operational environment described below to assure the DSR-85/85P superior performance and to maintain the excellent serviceability and accessibility.

2-1. INSTALLATION PROCEDURE

START

DETERMINATION OF INSTALLATION PLACE
- · · · 2-2. OPERATIONAL ENVIRONMENT
- · · · 2-3. OPERATING VOLTAGE
- · · · 2-4. INSTALLATION SPACE

UNPACKING
- · · · 2-5. SUPPLIED ACCESSORIES

RACK MOUNTING
- · · · 2-7. RACK MOUNTING

CONNECTORS
- · · · 2-8. MATCHING CONNECTORS
- · · · 2-8-1. Input/Output Signals of the Connectors
- · · · 2-9. INSTALLATION SETUP AND ADJUSTMENT

INITIAL SETUP

OPERATION CHECK
- · · · If an error message is shown on the time counter, refer to "3-3. ERROR MESSAGE" in SERVICE MANUAL VOL. 1.

END

2-2. OPERATIONAL ENVIRONMENT

- Operating temperature : +5 °C to +40 °C
- Humidity : 80 % or less
- Storage temperature : −20 °C to +60 °C
- Locations to avoid :
  - Areas where the unit will be exposed to direct sunlight or any other strong lights.
  - Dusty areas or areas where it is subject to vibration.
  - Areas with strong electric or magnetic fields.
  - Areas near heat sources.

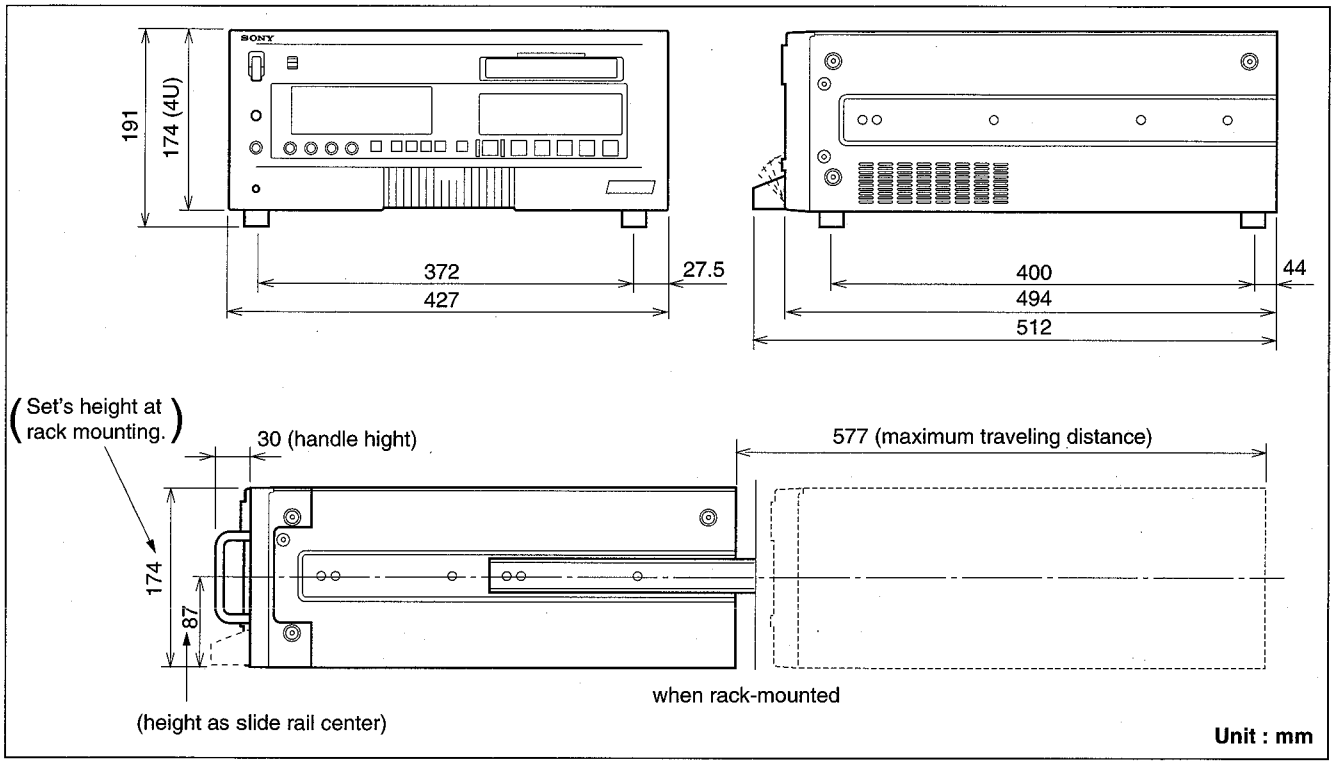
  (Good air circulation is essential to prevent internal heat build-up. Place the unit in location with sufficient air circulation. Do not block the ventilation holes on the cabinet and the rear panel.)
- Horizonal condition : within ±30°

2-3. OPERATING VOLTAGE

- Power voltage : AC 100 V to 120 V/NTSC
  AC 200 V to 240 V/PAL
- Power frequency : 50/60 Hz
- Power consumption : 185 W

2-4. INSTALLATION SPACE

(1) The rear side must be at least 40 cm away from the walls for ventilation and maintenance.
(2) When the unit is operated on a desk or similar condition, assure that the clearance above the unit is at least 40 cm to provide accessibility to the printed circuit boards and other mechanical parts. Note that it is not necessary to provide the space when the unit is mounted in a rack since the printed circuit boards can be repaired after it is pulled out.



2-5. SUPPLIED ACCESSORIES

- AC power cord : (1)
- RCC-5G 9-pin remote cable : (1)
- Operating instructions : (1)

2-6. OPTIONAL ACCESSORIES

- TBC remote control unit : UVR-60/60P
- Rack mount Kit : RMM-130
  (The unit can be mounted in a 19-inch standard rack)
- Remote control cable : RCC-5G/10G/30G
- Cleaning cassette tape : PDVM-12CL
- Circus remote control : SVRM-100A
- Digital video cassette (Mini size) : PDVM-12ME/22ME/32ME/40ME
- Digital video cassette (Standard size) : PDV-64ME/94ME/124ME/184ME
- SDI input/output board : DSBK-120/120P
- Time code input/output board : DSBK-130/130P

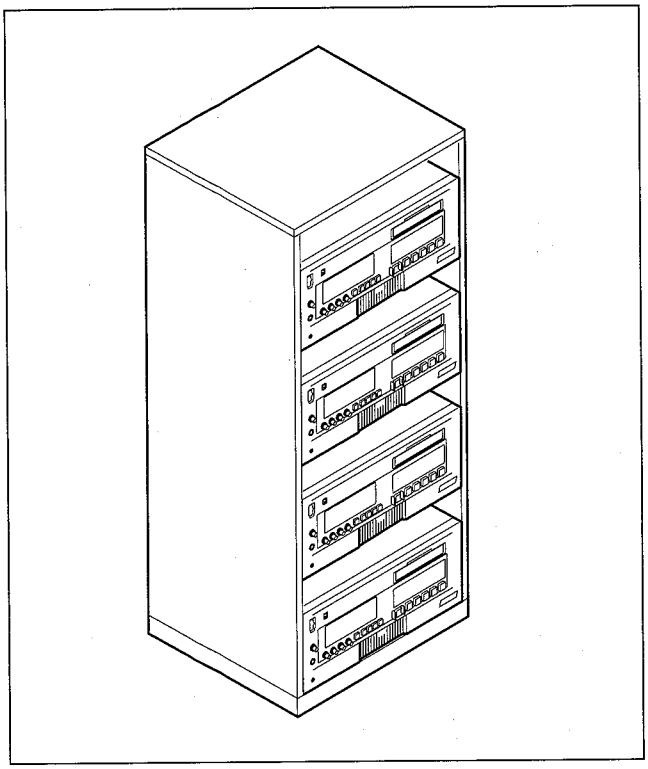
2-7. RACK MOUNTING

The unit can be mounted in a 19-inch standard rack.
It is recommended to use the following kit.

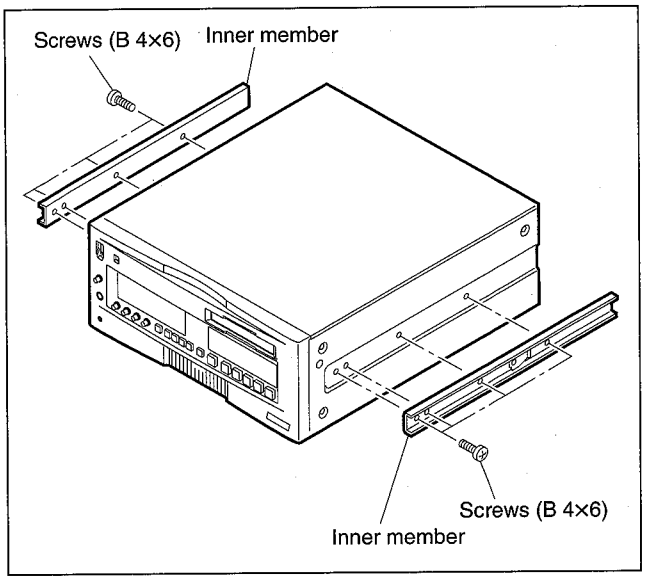
Rack Mount Kit : RMM-130 (optional accessory)
or
RACK-MOUNT SLIDES : MODEL 305
slide length 22 inch
(ACCURIDE)

Note for rack mounting :

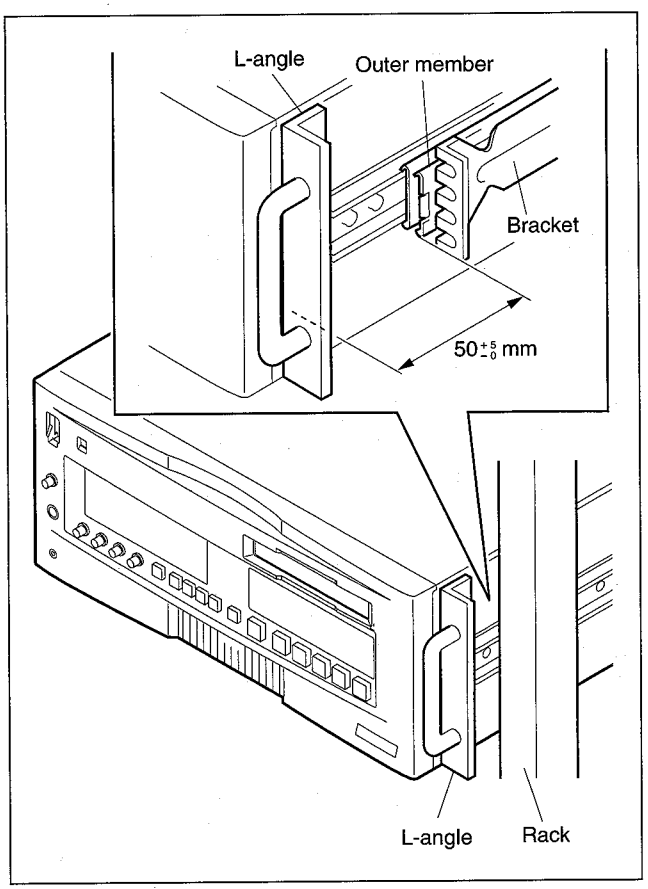
- When several VTRs are mounted in a rack, it is recommended to install a fan for ventilation. Good air circulation is essential to prevent internal heat build-up in a rack (+5 °C to +40 °C must be met for all units).
- Never remove an upper panel and lower panel during rack mounting.
- Be sure to secure the rack to the floor to avoid accidents when a unit is pulled out.
- Connect long enough cables on the connector panel, considering that the unit is pulled out.
- This equipment can use with two tiers.
  But with three tiers and more, keep the spaces between the each VTRs in the rack 1 unit (about 44 mm) or more.



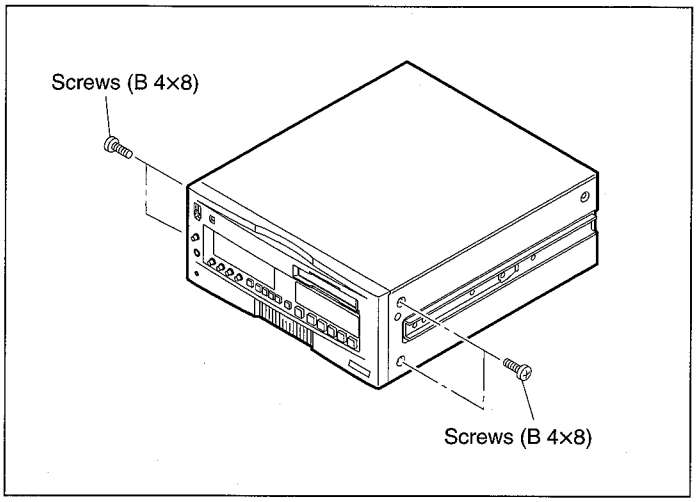
1. Remove the four screws on right and left side panels. And install the Inner Members of the rails to the right and left side panels with the screws removed.



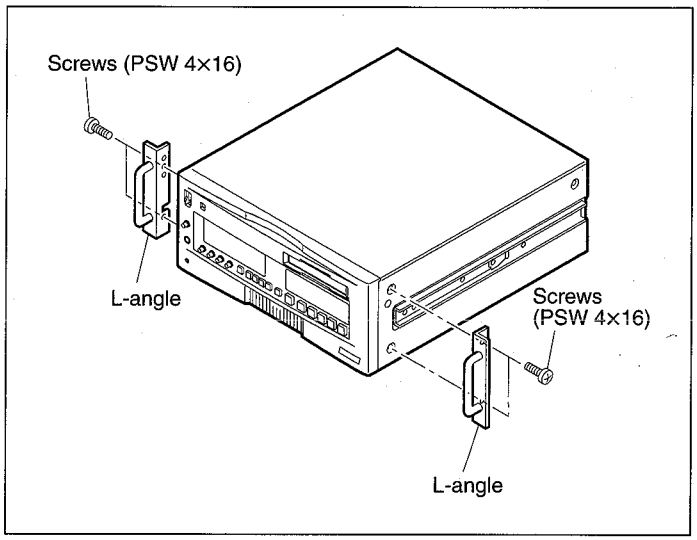
2. Install the Outer Member Brackets of the slide rails to the rack. Adjust the distance from the edge of the slide rail to the outside of the rack so that it meets the required specification.



3. Remove the two screws (B 4×8) on the right and left side panels. (Be careful not to lose these four screws.)



4. Install the L-angles to the holes described in step 3 with the supplied screws (PSW 4×16) in RMM-130 for these L-angles.



Note : Never use screws PSW 4×16 to install the right and left side panels without L-angles. Be sure to install the panels with the screws B 4×8 removed in step 3. Screws for L-angles are longer than the side panels. Therefore, using the screws PSW 4×16 may cause trouble in the unit.

2-8. MATCHING CONNECTORS

When external cables are connected to the connector on a connector panel during maintenance, the hardware listed below (or equivalents) must be used.

Panel indication	Matching Connector/Cable	
	Connector/Cable	Sony Part No.
ANALOG I/O	BNC, MALE	1-560-069-11
REF. VIDEO IN/OUT		
TIME CODE IN/OUT		
VIDEO IN/OUT		
COMPONENT VIDEO IN/OUT		
MONITOR AUDIO OUT	PIN PLUG	Standard Product
S VIDEO IN/OUT	YC-15 V (1.5 m)	optional accessory
AUDIO IN CH-1/2/3/4	XLR 3P, MALE	1-508-084-11
AUDIO OUT CH-1/2/3/4	XLR 3P, FEMALE	1-508-083-11
QSDI INPUT	BNC, MALE	1-560-069-11
QSDI OUTPUT	BNC, MALE	1-560-069-11
DIGITAL AUDIO (AES/EBU)	XLR 3P, MALE	1-508-084-11
INPUT CH-1/2, CH-3/4		
OUTPUT CH-1/2, CH-3/4	XLR 3P, FEMALE	1-508-083-11
TBC REMOTE	CONNECTOR, D-SUB 15P, FEMALE	1-561-610-21
	and JUNCTION SHELL, 15P	1-561-929-00
REMOTE	CONNECTOR, D-SUB 9P, MALE	1-560-651-00
	and JUNCTION SHELL, 9P	1-561-749-00
	RCC-5G (5 m)	supplied accessory
	RCC-10G (10 m)	optional accessory
	RCC-30G (30 m)	optional accessory

2-8-1. Input/Output Signals of the Connectors

INPUT

REF.VIDEO : BNC×2 (loop-through)
1.0 Vp-p, 75 Ω, sync negative : for composite video signal (black burst signal possible)

VIDEO IN : BNC×2 (loop-through)
1.0 Vp-p, 75 Ω, sync negative

COMPONENT VIDEO : BNC×3
Luminance : 1.0 Vp-p, 75 Ω, sync negative
R-Y/B-Y : 0.7 Vp-p, 75 Ω (NTSC : 75 % PAL : 100 %)

S VIDEO : DIN 4P×1
Y : 1.0 Vp-p, 75 Ω
C : NTSC 0.286 Vp-p (burst level), 75 Ω
PAL 0.3 Vp-p (burst level), 75 Ω

SDI* : BNC×2 (active-through)
Serial digital interface format (270 Mbps),
SMPTE 259M/ITU-R BT.656
*Using optional DSBK-120/120P (SDI input/output board)

QSDI : BNC×1
Serial digital interface (DVCAM compression signal : Video + Audio + TC signal)

AUDIO IN : XLR 3P×4
Reference level switchable (−6/0/+4 dBu), 600 Ω/10 kΩ switchable, balanced

AES/EBU : XLR 3P×2
110 Ω, balanced

TIME CODE* : BNC×1
0.5 to 18 Vp-p, 3 kΩ, unbalanced
*Using optional DSBK-130/130P (time code input/output board)

CONTROL-S (SIRCS) : Mini jack (exclusive use)

OUTPUT

REF.VIDEO : BNC×1
NTSC 0.286 Vp-p, 75 Ω, sync negative (composite sync + burst signal)
PAL 0.3 Vp-p, 75 Ω, sync negative (composite sync)

VIDEO OUT : BNC×2
1/2 (SUPER) 1.0 Vp-p, 75 Ω, sync negative

COMPONENT VIDEO : BNC×3
Luminance : 1.0 Vp-p, 75 Ω, sync negative
R-Y/B-Y : 0.7 Vp-p, 75 Ω (NTSC : 75 % PAL : 100 %)

S VIDEO : DIN 4P×2
Y : 1.0 Vp-p, 75 Ω, sync negative
C : NTSC 0.286 Vp-p (burst level), 75 Ω
PAL 0.3 Vp-p (burst level), 75 Ω

SDI* : BNC×2
Serial digital interface format (270 Mbps),
SMPTE 259M/ITU-R BT.656
*Using optional DSBK-120/120P (SDI input/output board)

QSDI : BNC×1
Serial digital interface (DVCAM compression signal : Video + Audio + TC signal)

AUDIO OUT : XLR 3P×4
+4 dBu, 600 Ω load, balanced (low impedance)

MONITOR AUDIO : PHONO JACK×1
−6 dBu, 47 kΩ load, unbalanced

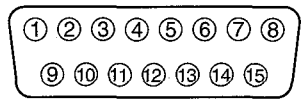
HEADPHONES : Stereo phone jack×1
−16 dBu (front VR max.), 8 Ω load, unbalanced

AES/EBU : XLR 3P×2 2 to 7 Vp-p
110 Ω, balanced

TIME CODE* : BNC×1
2.2 Vp-p±3.0 dB, 75 Ω, unbalanced
*Using optional DSBK-130/130P (time code input/output board)

TBC REMOTE (D-sub 15 pin : MALE)

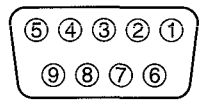
<external view>



Pin No.	Input/Output Signal	Operating Voltage	IN/OUT
1	SYNC CONTROL	−5 to +5 V	IN
2	HUE CONTROL	−5 to +5 V	IN
3	SC CONTROL	−5 to +5 V	IN
4	VIDEO LEVEL CONTROL	−5 to +5 V	IN
5	SET UP CONTROL	−5 to +5 V	IN
6	CHROMA LEVEL CONTROL	−5 to +5 V	IN
7	−9 V SUPPLY	−9 V	OUT
8	GND		
9	FRAME GND		
10	–	–	–
11	–	–	–
12	–	–	–
13	Y/C DELAY CONTROL	−5 to +5 V	IN
14	–	–	–
15	+9 V SUPPLY	+9 V	OUT

REMOTE (D-sub 9 pin : FEMALE)

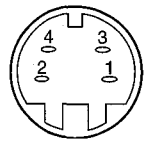
<external view>



Pin No.	Controlling Device	Controlled Device
1	Frame Ground	Frame Ground
2	Receive A	Transmit A
3	Transmit B	Receive B
4	Transmit Common	Receive Common
5	–	–
6	Receive Common	Transmit Common
7	Receive B	Transmit B
8	Transmit A	Receive A
9	Frame Ground	Frame Ground

S VIDEO (Circular 4 pin)

<external view>



Pin No.	Input/Output Signal
1	Y (G)
2	C (G)
3	Y (X)
4	C (X)

2-9. INSTALLATION SETUP AND ADJUSTMENT

2-9-1. Switch Settings on the Connector Panel

When the unit is installed, be sure to perform the following setup and adjustment. If the adjustment is not performed, the unit may not operate properly.
Refer to the operation manual "Chapter 1 Overview" for setup and adjustment.

[Connector Panel]

(1) The setting of audio input impedance select switch :
600 Ω ON/OFF
ON : 600 Ω, balanced
OFF : 10 kΩ, balanced

(2) The setting of audio input level select switch :
+4 dBm: +4 dBu reference level on output side
0 dBm: 0 dBu reference level on output side
−6 dBm: −6 dBu reference level on output side

(3) The setting of 75 Ω termination switch :
REF VIDEO 75 Ω ON/OFF
INPUT VIDEO 75 Ω ON/OFF
ON : When the line is terminated in this unit.
OFF : When another unit is connected with this unit.

2-9-2. Switch Setting on the Front Panel Unit

[Front Panel]

(1) AUDIO REC MODE SELECT : Select 2CH/4CH
2CH: FS48 kHz 16 bit
4CH: FS32 kHz 12 bit

(2) VIDEO INPUT select switch setting: VIDEO IN Y-R, B/COMPOSITE/S VIDEO
Y-R, B ; Betacam component signal
COMPOSITE ; Ordinary video signal
S VIDEO ; Y/C separation type S Video signal

(3) AUDIO INPUT SELECT : Analog/Digital (AES/EBU) / (SDI)

(4) QSDI : Audio, Video, Time code (EXT.sel) is inputted from QSDI through the 1 BNC Cable.

[Sub Panel]

(1) SYNC PHASE : Adjusts the H sync phase of video output signal with reference to the REF. IN signal.

(2) SC PHASE : Adjusts the subcarrier phase of the composite video output signal with reference to the REF. IN signal.

(3) MENU : Turns on and off the menu mode.

(4) [↑] [↓] [←] [→] : Used for setting items in the menu, and for modifying the TC initial value and UB data.

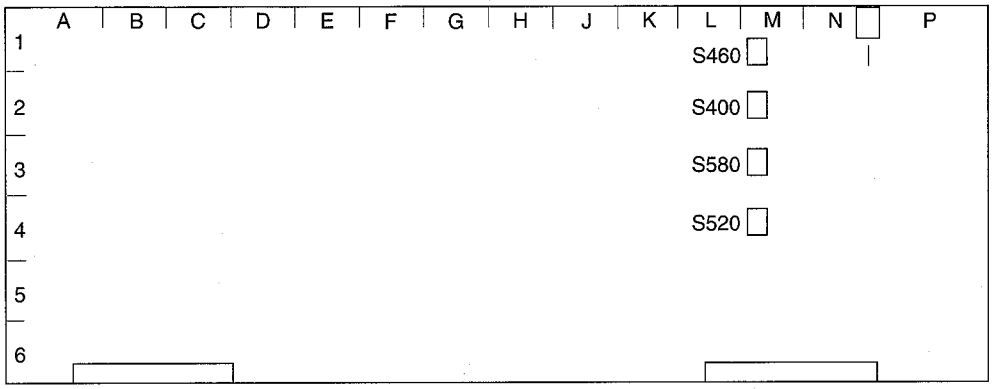
(5) RESET (NO) : Used for the following purposes:
- Initialization of the menu setting
- "No" reply from the DSR-85/85P to the inquiry.
- TC data reset (on display block)

(6) SET (YES) : Used for the following purposes:
- Storing the menu and TC setting
- "Yes" reply from the DSR-85/85P to the inquiry.

(7) TC RESET : Used for setting the TC initial value and UB data (on display block).

2-9-3. On-board Switch Setting

AU-238



Function	Switch No.		Output Level (dBu)			
			+4	0	−3	−6
CH-1 AUDIO OUTPUT REF. LEVEL SELECT SW	S400	1	OFF	OFF	OFF	ON
		2	OFF	ON	OFF	OFF
	SL400		OPEN	OPEN	SHORT	OPEN
CH-2	S460	1	OFF	OFF	OFF	ON
		2	OFF	ON	OFF	OFF
	SL460		OPEN	OPEN	SHORT	OPEN
CH-3	S520	1	OFF	OFF	OFF	ON
		2	OFF	ON	OFF	OFF
	SL520		OPEN	OPEN	SHORT	OPEN
CH-4	S580	1	OFF	OFF	OFF	ON
		2	OFF	ON	OFF	OFF
	SL580		OPEN	OPEN	SHORT	OPEN
FACTORY SETTING	–		O			

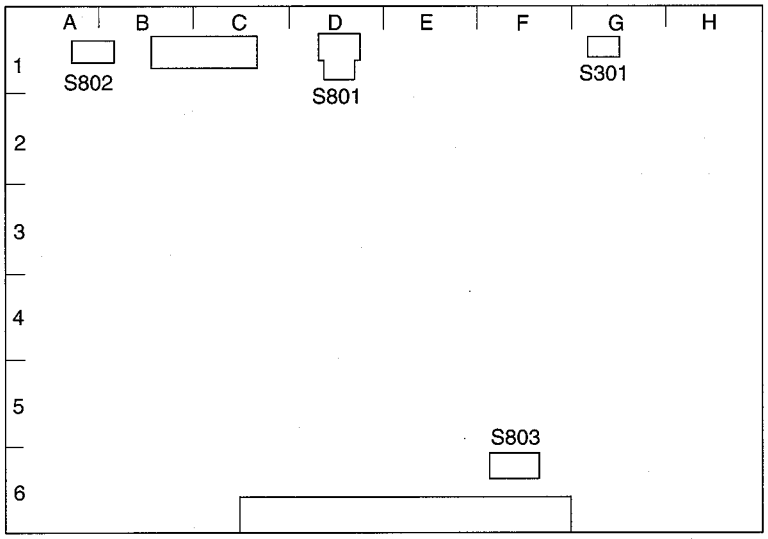
Note : The setting of audio input/output level

When connecting Sony VTR, Sony audio mixer "MXP series" or DSR series and ES-3/7 with XLR cables, set the level at +4 dBu (factory default setting).

When connecting Sony VTR having the pin-jack type input/output connector, using XLR ↔ pin-jack conversion cable, set the level at −6 dBu normally.

For more detail check the audio reference levels of the equipment to be connected, and set the level appropriately.

RP-90



S301 : Not used. (OFF) * It is not mounted to the RP-90 board with part no. suffix of -15 and higher.

S802 : Used for tape path maintenance

Switch No.	Function	Description	Factory Setting
1	ITI center shift SW	Set to ON when the tracking alignment tape is played back.	OFF
2	FN/2 SEL	Factory use	OFF
3	FN SEL	Factory use	OFF
4	–	No assign	OFF

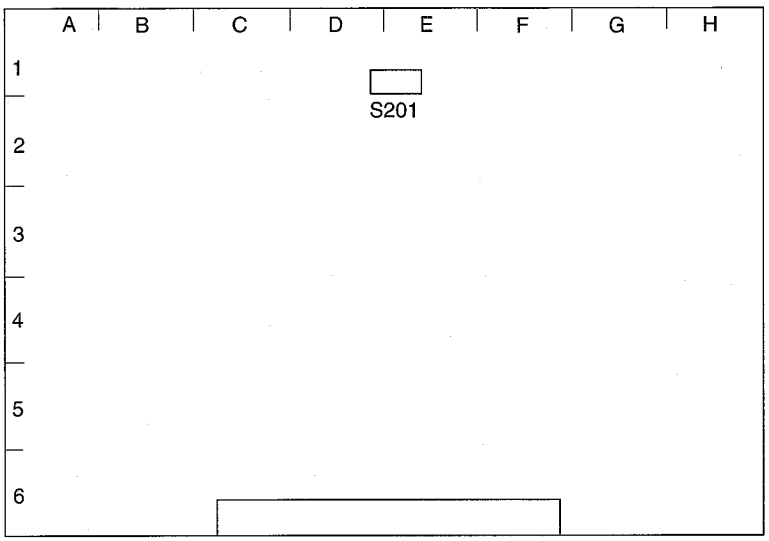
S801 : Used for CH (Head) select of RF OUT/RF ENVELOPE OUT

SW Position	Select CH	
0	REC-E1	RF envelope waveform of CH selected is monitored at TP804.
1	REC-E2	
2	E1-PB	
3	E2-PB	
4	O2-PB	
5	O1-PB	
6	E1-SP	
7	E2-SP	
8	O2-SP	
9	O1-SP	
A	NO assign	Output waveform is not defined.
B	NO assign	
C	NO assign	
D	NO assign	
E	NO assign	
F	NO assign	

S803 : PB RF ON/OFF sw that is used as a pair with S801.
(Set all bits to ON when checking RF envelope with S801 as a pair. Be sure to set all bits to OFF for normal operation.)

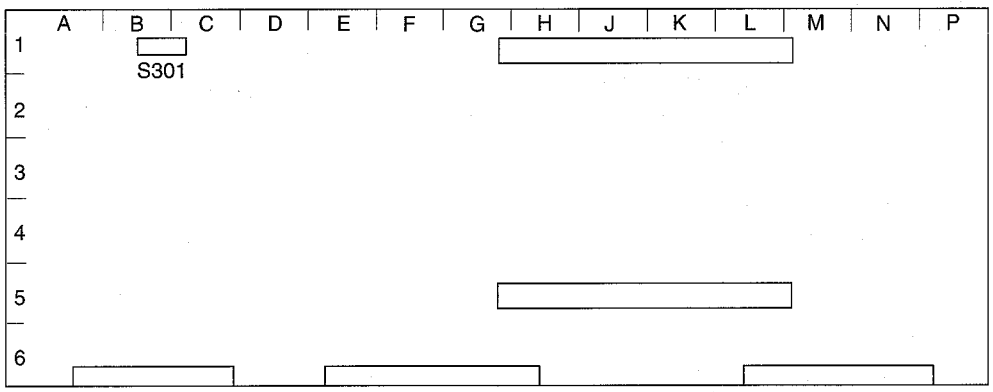
Switch No.	PB RF	Factory Setting
1	O1-PB	OFF
2	O2-PB	OFF
3	E2-PB	OFF
4	E1-PB	OFF
5	O1-SP	OFF
6	O2-SP	OFF
7	E2-SP	OFF
8	E1-SP	OFF

EQ-57



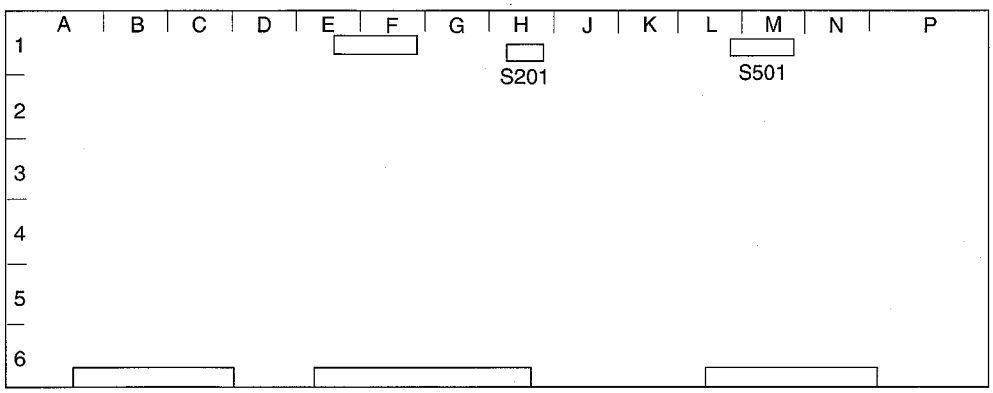
S201 : Not used (OFF)

SDI-8



S301 : Used for checking QSDI output
(Actuate the switch only when the main unit is in maintenance mode. Otherwise, set the switch to OFF.)
EQ : Output the test signal of the auto cable equalizer to QSDI.
OFF : Output the playback signal to QSDI. (factory setting)
PLL : Output the PLL LOCK-in test signal to QSDI.

SY-220



S201 : 4 bit

Destination Code Switch Setting

	UC	J	PAL
No. 1	OFF	OFF	ON
No. 2	OFF	ON	*) ON/OFF

*** Note) ON/OFF indicates that either position is acceptable. Set it to OFF normally.**

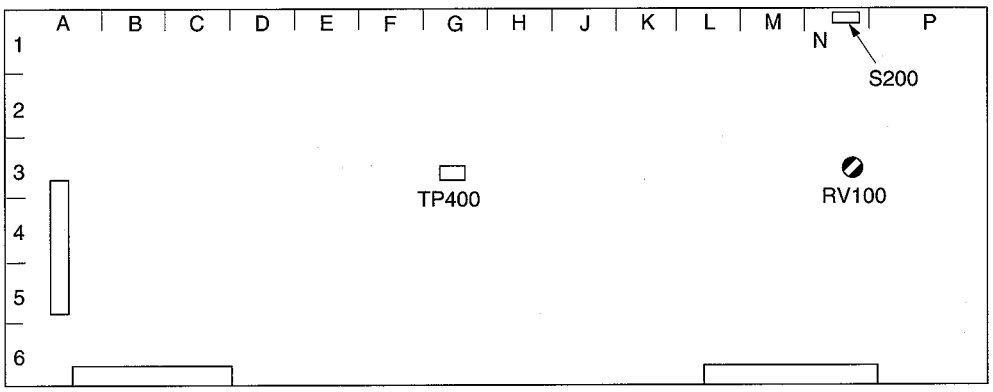
Function Setting

	ON	OFF	Factory Setting
No. 3	factory use	factory use	OFF
No. 4	factory use	factory use	OFF

S501 : 8 bit

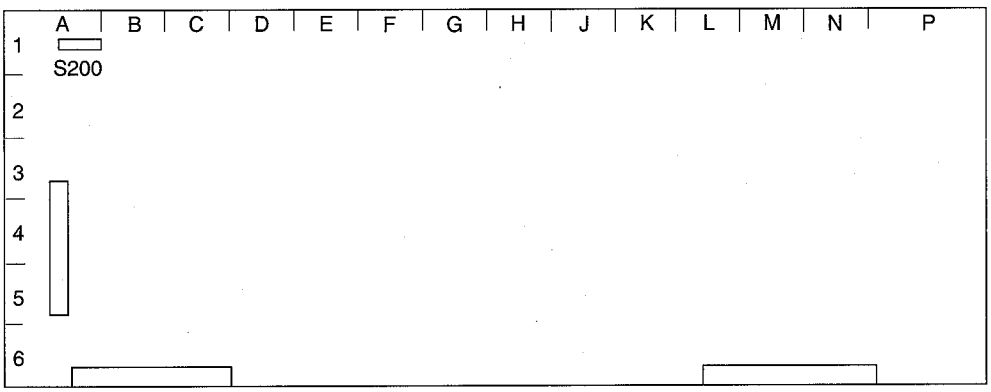
Switch No.	Description	Factory Setting
1	Set this switch to ON in some adjustment modes. • Search speed in LOCAL is as follows : PLAY/F.FWD pressed simultaneously : FWD search×5 PLAY/REW pressed simultaneously : REW search×5 • HOURS METER can enter reset mode.	OFF
2	Forced function×4 MODE	OFF
3	Use this switch when operating the machine with cassette removed.	OFF
4	This defeats an error detection of mechanism and servo system alignment.	OFF
5	factory use	OFF
6	factory use	OFF
7	factory use	OFF
8	factory use	OFF

DDE-4/DDE-4P



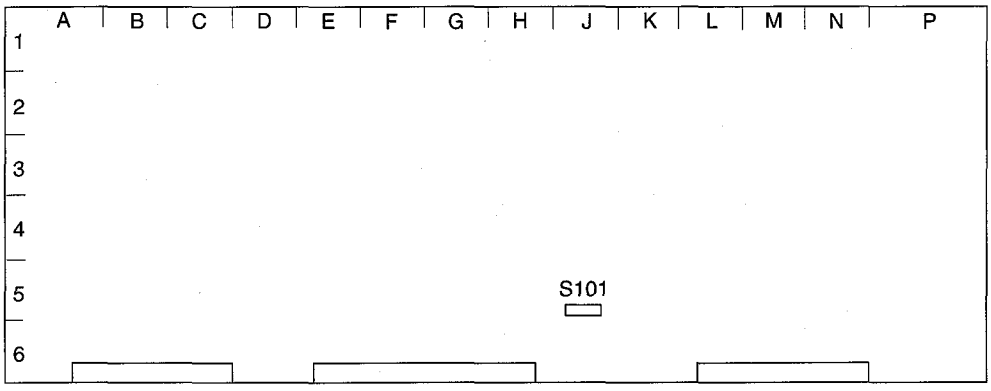
S200 : Set this switch to ON when RV100 (Composite A/D Input Level Adj) is adjusted. (factory setting : OFF)
* Operates in the maintenance mode only. (Level marker insertion.)

DEN-5/DEN-5P



S200 : Used for checking SDI output. (When DSBK-120/120P is installed.)
EQ : Output the test signal of the auto cable equalizer to SDI.
NORMAL : Output the playback signal to SDI. (factory setting)
PLL : Output the PLL LOCK-in test signal to SDI.

DV-16



* Part no. suffix of -15 and higher

S101

Switch No.		Factory Setting
1	Factory use	ON
2		ON
3		ON
4		OFF
5		OFF
6		OFF

2-9-4. System Adjustment After Installation

Observe the following precautions when this equipment is used for editing system.

- The REF. VIDEO INPUT requires video signal which complies with RS-170A (NTSC).
- Adjust the sync phase of this equipment to the system sync with [SYNC PHASE] control on the sub control panel.
- Adjust the SCH phase of this equipment to the system SCH with [SC PHASE] control on the sub control panel.
- When this equipment is connected to the type of switcher that does not replace the sync signal, the SYNC/BURST level adjustment is required.

2-9-5. Connection of Editor Controller

When an edit controller is connected, set the edit controller as follows.

RM-450/450CE

LEFT SWITCH

	7	6	5	4	3	2	1	0
NTSC/PAL	OFF	–	–	OFF	–	–	–	–

RIGHT SWITCH

	7	6	5	4	3	2	1	0
NTSC	OFF	–	OFF	ON	OFF	OFF	ON	ON
PAL	ON	–	OFF	ON	OFF	OFF	ON	ON

PVE-500

No setting required.

BVE-600/900/910/2000

	BLOCK-1								BLOCK-2						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NTSC	80	10	00	96	05	05	03	80	0A	08	FE	00	80	5A	FF
PAL	81	10	00	7D	05	05	02	80	0A	07	FE	00	80	4C	FF

FXE-100/100P/120/120P

	BLOCK-1								BLOCK-2						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
NTSC	80	10	00	96	05	05	03	80	0A	08	FE	00	80	5A	FF
PAL	81	10	00	7D	05	05	02	80	0A	07	FE	00	80	4C	FF

BVE-800

SW2

	1	2	3	4	5	6	7	8
NTSC/PAL	ON	OFF	ON	ON	–	ON	ON	–

SW3

	1	2	3	4	5	6	7	8
NTSC	OFF	ON	OFF	ON	–	ON	OFF	OFF
PAL	ON	ON	OFF	ON	–	ON	OFF	OFF

*** When connected with BVE-800, AFTER CUE UP of SETUP MENU → OPERATIONAL FUNCTION must be set to STOP.**

2-10. SETUP CHECK SHEET

Write down the setup information (setup menu and switch positions on board) before starting to repair the equipment. Use it for re-setup.
For an editing room where system connection is frequently changed, copy this sheet and write the several types of setup.

- Setup menu information can be saved separately from record area in this equipment. But some repair work can destroy the saved information. This sheet is effective for the backup.

CONNECTOR PANEL

AUDIO IN CH-1 600 Ω	☐ ON	☐ OFF
AUDIO IN CH-2 600 Ω	☐ ON	☐ OFF
AUDIO IN CH-3 600 Ω	☐ ON	☐ OFF
AUDIO IN CH-4 600 Ω	☐ ON	☐ OFF
REF. VIDEO IN 75 Ω	☐ ON	☐ OFF
VIDEO IN 75 Ω	☐ ON	☐ OFF

FRONT PANEL

AUDIO REC MODE SELECT	☐ 2CH	☐ 4CH			
VIDEO IN	☐ Y-R, B	☐ COMPOSITE	☐ S VIDEO	☐ SDI	☐ QSDI
AUDIO IN	☐ ANALOG	☐ DIGITAL (AES/EBU)	☐ SDI	☐ QSDI	
REMOTE/LOCAL	☐ REMOTE	☐ LOCAL			
COUNTER/TC/U-BIT	☐ COUNTER	☐ TC	☐ U-BIT		
HEADPHONES	☐☐☐☐☐☐☐☐☐☐				

SETUP MENU

Menu Level 1	Menu Level 2/3		Factory Setting	Setting
OPERATIONAL FUNCTION	AUTO EE SELECT	CASSETTE OUT	EE	
		F. FWD / REW	PB	
		STOP	PB	
		STANDBY OFF	PB	
	LOCAL ENABLE		STOP & EJECT	
	MAX SEARCH SPEED		×32	
	AUTO REW		ENABLE	
	PREROLL TIME		5 SEC	
	AFTER CUE-UP		STOP	
	PLAY START		5 FRAME DELAY	
	A1 EDIT CH		CH-1	
	A2 EDIT CH		CH-2	
	A MODE CHANGE		OFF	
	QSDI AUDIO MON		MUTE	

Menu Level 1	Menu Level 2/3		Factory Setting	Setting
DISPLAY CONTROL	CHARA. DISPLAY		ON	
	CHARA. POSITION			
	CHARA. TYPE		WHITE (with BKGD)	
	DISPLAY INFO		TIME DATA & STATUS	
	SUB STATUS		OFF	
	MENU DISPLAY		WHITE (with BKGD)	
	PEAK HOLD		OFF	
	OVER DISP HOLD		OFF	
	BRIGHTNESS		100 %	
	ALARM		ON	
	REF. ALARM		ON (LIMITED)	
TIME CODE	TC MODE		INT PRESET	
	RUN MODE		FREE RUN	
	DF MODE (NTSC only)		ON (DF)	
	UB BINARY GP.		000 : NOT SPECIFIED	
TAPE PROTECTION	FROM STOP	STOP TIMER	8 MIN	
		NEXT MODE	STANDBY OFF	
	FROM STILL	STILL TIMER	8 MIN	
		NEXT MODE	STEP FWD	
VIDEO CONTROL	STILL MODE		FIELD I STILL	
	SETUP REMOVE (NTSC only)		OFF	
	SETUP ADD (NTSC only)		OFF	
AUDIO CONTROL	DIGITAL INPUT		VARIABLE	
	REC POINT MUTE		OFF	
	REF LEVEL		NTSC : –20 dB PAL : –18 dB	
factory use	PWR. ON UNTH		ON	
	LEVEL MARKER		OFF	
	PROCESS EE		OFF	
	REPEAT MODE		OFF	
	REPEAT TOP		TAPE TOP	
	REPEAT END		VIDEO END	
	A PRESET		00 : 00 : 00 : 00	
	B PRESET		00 : 00 : 00 : 00	
	CLIP LINK CUEUP		ON	
MENU GRADE			BASIC	

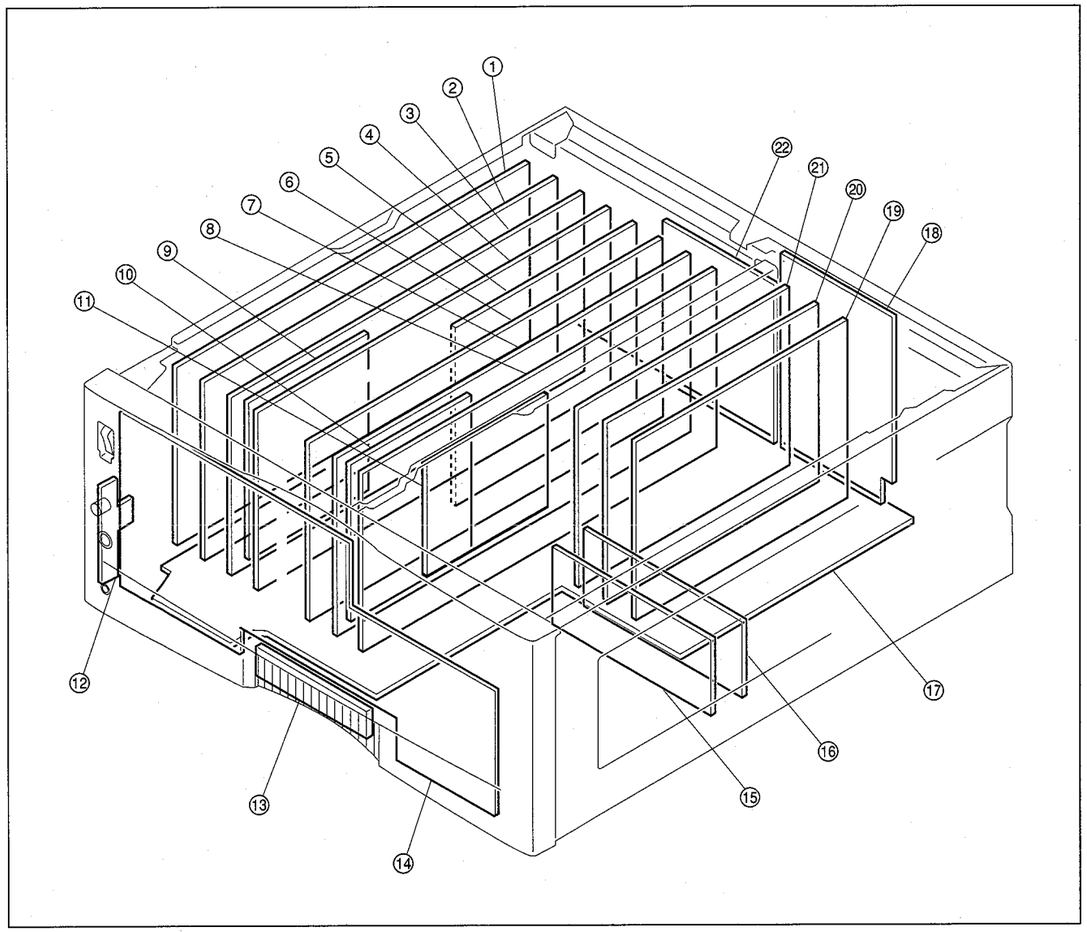
SWITCH ON BOARD

BOARD	SWITCH	Factory Setting	Setting
AU-238	S400 : CH-1 AUDIO OUTPUT REF. LEVEL SELECT SW	Depend on Setting	
	S460 : CH-2 AUDIO OUTPUT REF. LEVEL SELECT SW	Depend on Setting	
	S520 : CH-3 AUDIO OUTPUT REF. LEVEL SELECT SW	Depend on Setting	
	S580 : CH-4 AUDIO OUTPUT REF. LEVEL SELECT SW	Depend on Setting	
	SL400 : CH-1 AUDIO OUTPUT REF. LEVEL SELECT SW	Depend on Setting	
	SL460 : CH-2 AUDIO OUTPUT REF. LEVEL SELECT SW	Depend on Setting	
	SL520 : CH-3 AUDIO OUTPUT REF. LEVEL SELECT SW	Depend on Setting	
	SL580 : CH-4 AUDIO OUTPUT REF. LEVEL SELECT SW	Depend on Setting	

SECTION 3
SERVICE OVERVIEW

3-1. LOCATION OF MAIN PARTS

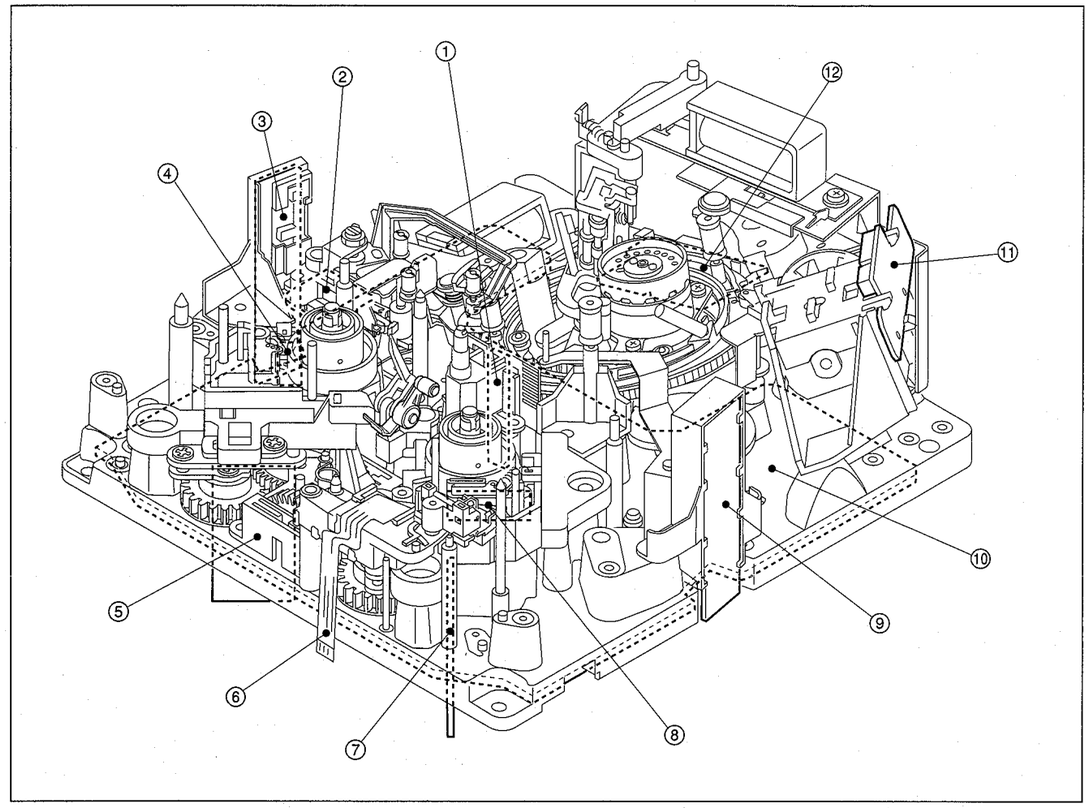
3-1-1. Location of Printed Circuit Boards

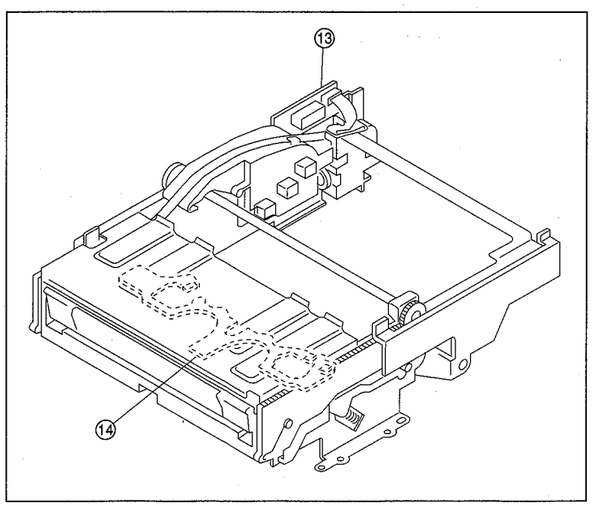


	Board Name	Circuit Configuration
①	AU-238 board	ANALOG AUDIO IN/OUT, A/D CONV, AES/EBU IN/OUT, SAMPLING RATE CONV, DA CONV, FS PLL
②	DA-120 board	SAMPLING RATE CONV, JOG/DATA/EDIT PROCESS, DSP
③	DDE-4/4P board	VIDEO INPUT PROCESS, 4:2:2 → 4:1:1 CONV, YC SEP, AD CONV
④	SDI-8 board	QSDI DEC/ENC, S ↔ P CONV, QSDI/SDI CONTROL CPU
⑤	DD-31 board	×4 DATA PROCESS
⑥	DV-16 board	DATA BLOCKING, PICTURE COMPRESSION, TIMING GEN, CHANNEL CODE/DECODE, TRACK ↔ FRAME CONV
⑦	DEN-5/5P board	4:1:1 → 4:2:2 CONV, REF SIGNAL GEN, DA CONV, OUTPUT DRIVER
⑧	SY-220 board	SYSTEM CONTROL, CAP/REEL SERVO, CHARACTER GEN
⑨	SDI-27 board (DSBK-120/120P)	SDI INPUT INTERFACE
⑩	SDI-28 board (DSBK-120/120P)	SDI OUTPUT INTERFACE
⑪	TC-90 board (DSBK-130/130P)	EXTERNAL TIME CODE IN/OUT
⑫	HP-73 board	HEADPHONE VOLUME/CONNECTOR, SIRCS CONNECTOR
⑬	FP-75 board	SUB PANEL MENU KEY/AUDIO MONITOR SWITCH, SYNC/SC PHASE ADJUST
⑭	KY-336 board	KEY SWITCH, AUDIO REC VOLUME, FL DISPLAY/DRIVE
⑮	PRE-32 board	PB HEAD AMP
⑯	REC-32 board	CHANNEL REC PROCESS, FE AMP, PB RF ENVELOPE DETECT
⑰	MB-640 board	MOTHER BOARD
⑱	CP-276 board	ANALOG VIDEO IN/OUT, TC IN/OUT, AUDIO MONITOR
⑲	RP-90 board	CHANNEL REC PROCESS, FE AMP, PB RF ENVELOPE DETECT
⑳	EQ-57 board	PB RF EQUALIZE, PLL, AD CONV, VITERBI
㉑	SV-161 board	SERVO MAIN, MECHA CONTROL, MOTOR DRIVE
㉒	CP-281 board	ANALOG AUDIO IN/OUT, AES/EBU IN/OUT, BAL → UNBAL, AUDIO IN LEVEL SELECT

3-1-2. Location of Main Mechanical Parts

Board Locations of Mechanism Deck

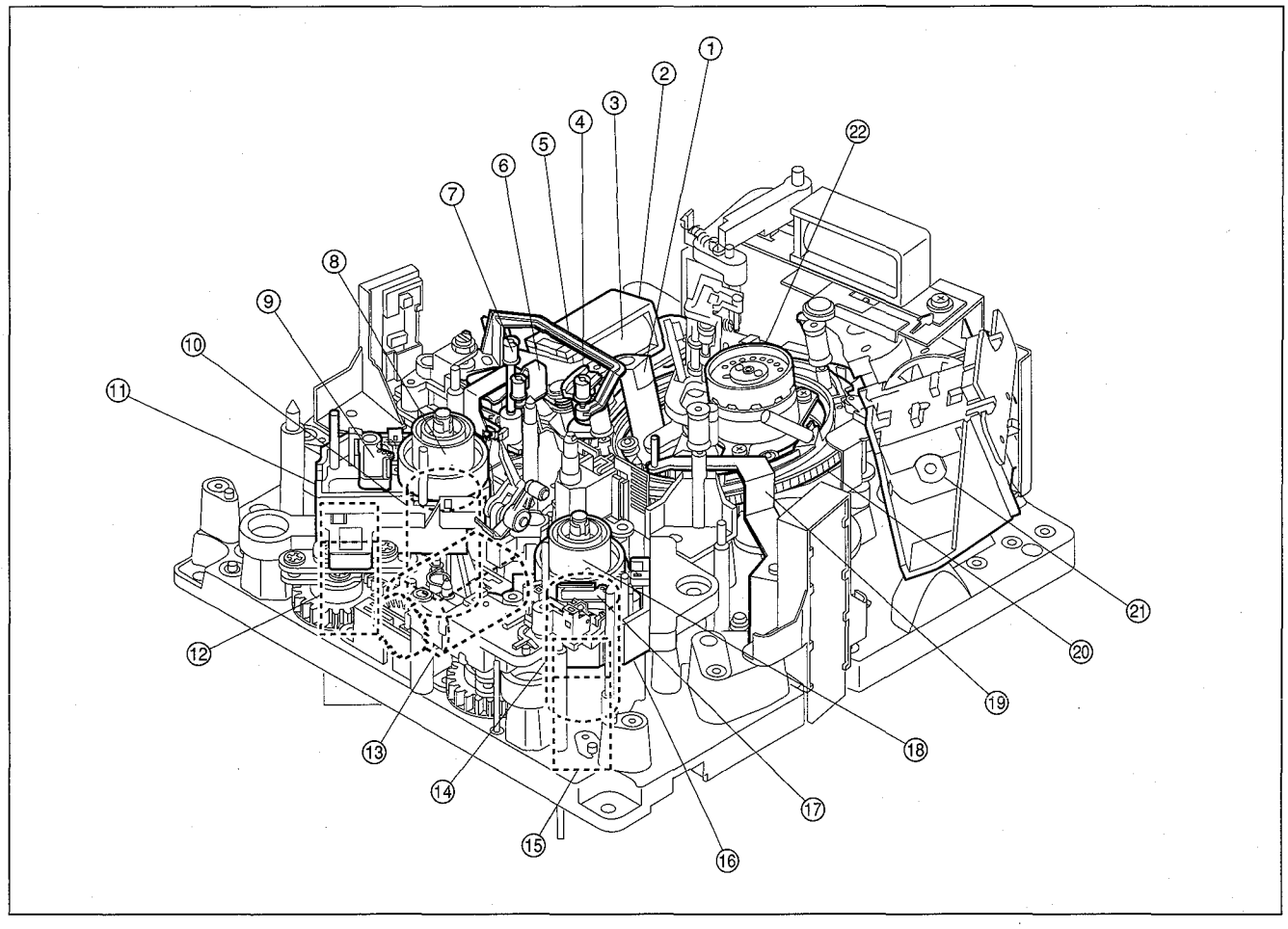




	Board Name	Circuit Configuration
①	PTC-87 board	TAPE TOP/END LED
②	TR-93 board	TEN-REG ARM POSITION SENSOR
③	PTC-86 board	TAPE END SENSOR, TENSION SENSOR CONNECTION
④	SE-315 board	S REEL FG SENSOR
⑤	RM-159 board	S REEL MOTOR/BRAKE SOL/FG SENSOR CONNECTION
⑥	FP-90 board	CONNECTION
⑦	RM-160 board	T REEL MOTOR/BRAKE SOL/FG SENSOR CONNECTION
⑧	SE-361 board	T REEL FG SENSOR
⑨	PTC-85 board	TAPE TOP SENSOR
⑩	MS-43 board	DRUM/CAPSTAN MOTOR DRIVE, CAPSTAN FG AMP, TAPE TOP/END SENSOR AMP, REEL POSITION SENSOR, SV DATA MEMORY
⑪	PTC-88 board	THREADING FG SENSOR, THREADING MOTOR CONNECTION
⑫	PTC-84 board	THREAD/UNTHREAD END SENSOR, PINCH SOL/CLEAN SOL/DEW CONNECTION
⑬	CC-75 board	CASSETTE COMPARTMENT DOWN 1/2/3 SENSOR CC UP/DOWN MOTOR CONNECTION
⑭	CC-76 board	CASSETTE IN 1/2/3 SENSOR

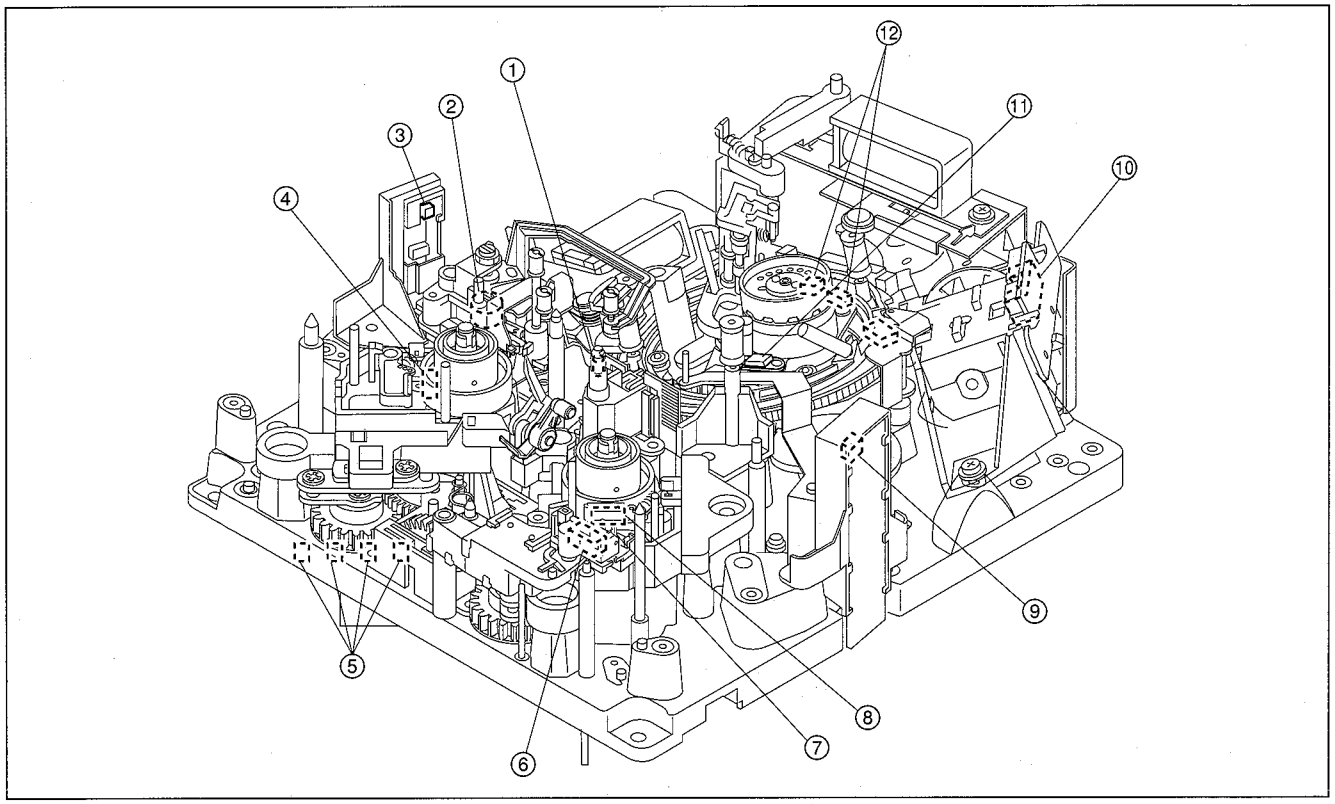
3-2

Locations of Main Parts



① Capstan Motor
② Pinch Press Assembly
③ Pinch Solenoid
④ Pinch Roller Arm Assembly
⑤ S Tension Regulator Arm (TG-3)
⑥ S Drawer Arm (TG-2)
⑦ S Arm Base (TG-1)
⑧ Reel Table (S) Assembly
⑨ Reel Brake (S) Assembly
⑩ S Reel Motor
⑪ Reel Block (S) Assembly
⑫ S Brake Solenoid
⑬ RS Motor
⑭ T Reel Motor
⑮ T Brake Solenoid
⑯ Reel Block (T) Assembly
⑰ Reel Brake (T) Assembly
⑱ Reel Table (T) Assembly
⑲ T Drawer Arm (TG-11)
⑳ Threading Ring Assembly
㉑ Gear Box Motor
㉒ Drum Assembly

3-1-3. Location of Sensors (1)



① Tape beginning / end detect LED
This sensor detects the beginning and end of the tape.

② Tension sensor
A tension arm operates to keep the tape tension constant during recording and playing. The tension sensor detects the position of the tension arm.

③ Tape end sensor
This sensor detects the end of the tape running in the FWD direction.

④ Supply reel table rotation sensor
This sensor detects the rotation of the supply reel table. The PG output of this sensor is input to the servo circuit to control the speed and torque of the reel motor rotation.

⑤ Reel L/S position sensor
This sensor detects whether the reel table is at the specified position in accordance with the size of the inserted cassette tape.

⑥ Cassette memory terminal
This terminal performs reading and writing of the data in the cassette memory, and checks the presence of the cassette memory.

⑦ Record proof sensor (common to standard and mini size cassettes)
Switch protecting S cassette metal tape from recording.

⑧ Take-up reel table rotation sensor
This sensor detects the rotation of the take-up reel table. The FG output of this detection sensor is input to the servo circuit to control the speed and torque of rotation of the reel motor.

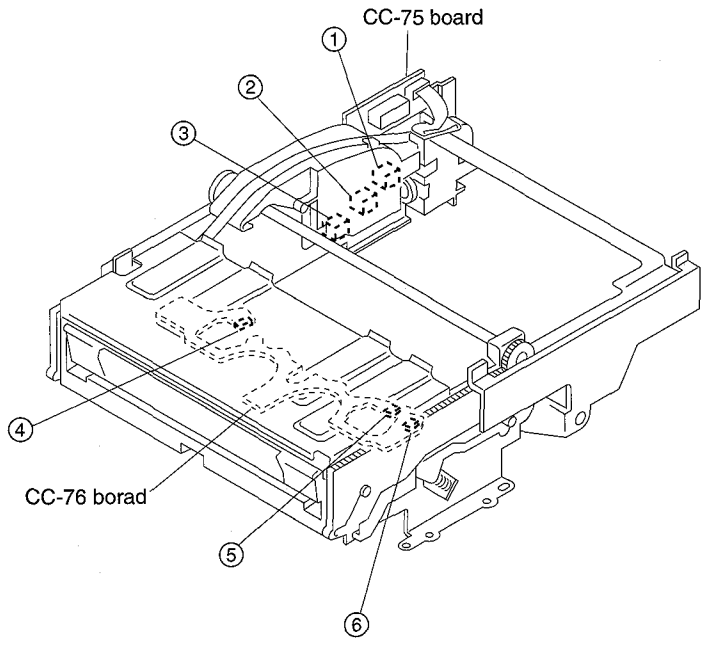
⑨ Tape beginning sensor
This sensor detects the beginning of the tape running in the FWD direction.

⑩ Gear box motor rotation sensor
This sensor detects the rotation speed of the gear box motor.
The FG output of this detection sensor is input to the servo circuit to control the threading speed so that too much force is not applied to the tape during threading.

⑪ Condensation sensor
This sensor detects condensation generated in the set.

⑫ Threading end/unthreading end sensor
This sensor detects whether the threading ring is at the position of the threading end or unthreading end.

Location of Sensors (2) ..... Cassette compartment

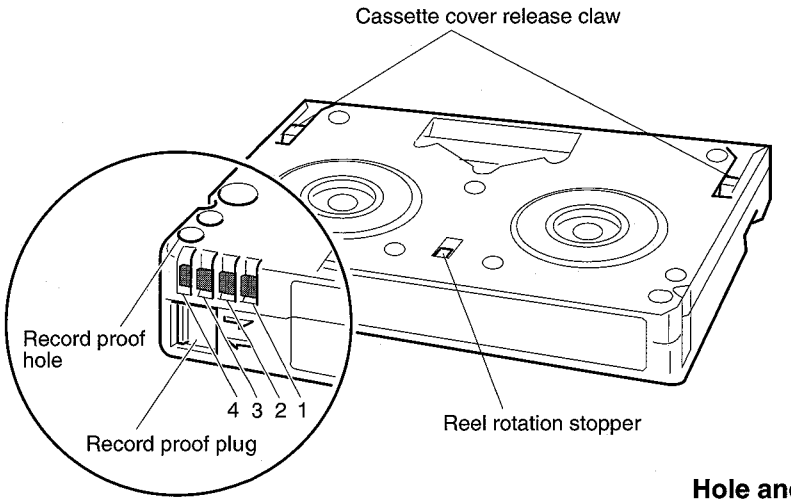


①, ②, ③ Cassette down sensor
The combination of sensors ①, ② and ③ detects movement of the cassette compartment.

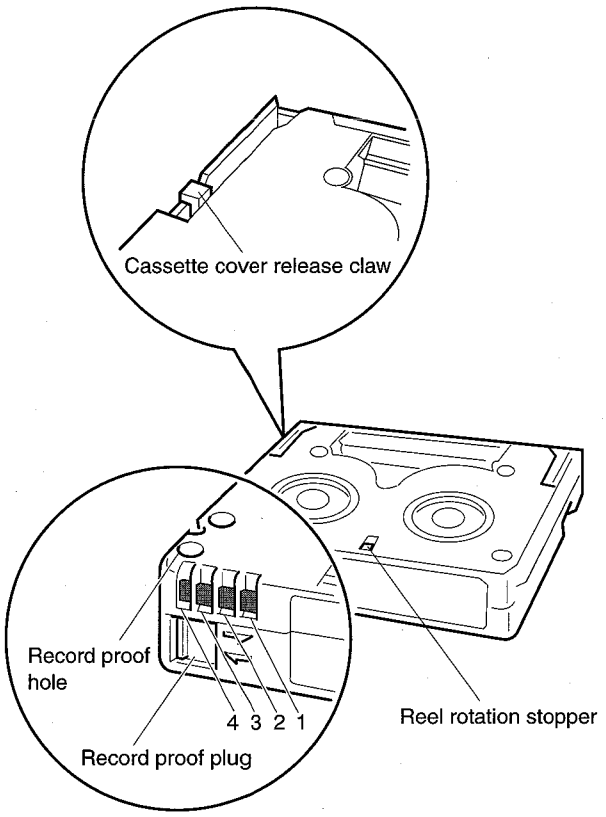
④ Left side in-sensor for standard and mini cassettes
⑤ Right side in-sensor for mini cassette
⑥ Right side in-sensor for standard cassette
The combination of sensors ④ and ⑤ detects insertion of a mini cassette.
The combination of sensors ④ and ⑥ detects insertion of a standard cassette.

3-2. FUNCTIONS OF RECORD PROOF HOLE AND RECORD PROOF PLUG OF CASSETTE

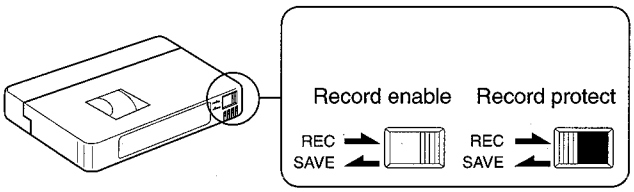
Standard cassette



Mini cassette



Hole and plug for record proof



- This plug controls the record proof switch according to open or close position.

Pin No.	Function	
	Equipped with built-in memory	**Not equipped with built-in memory**
1	+DC	Detecting tape thickness
2	DATA	Detecting tape type (Example : ME/MP)
3	CLOCK	Detecting tape application (Example : consumer/professional)
4	GND	–

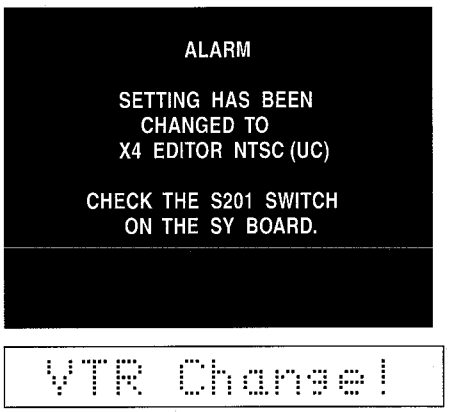
3-3. ERROR MESSAGES

3-3-1. Alarm Display

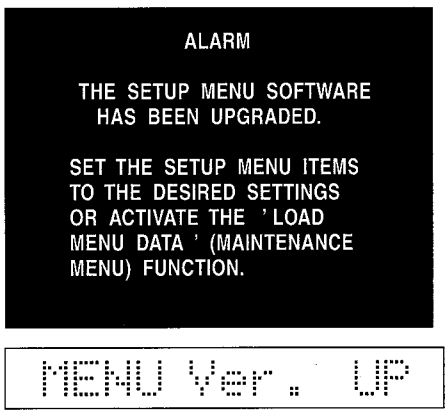
The DSR-85/85P has an alarm display function.
When a problem is detected, an alarm is displayed immediately in the timer counter block. The alarm and a message describing the countermeasure are displayed on a video monitor.
The alarm and message can be displayed on a monitor by connecting a monitor to the VIDEO 2 (SUPER) OUTPUT connector, and by turning on the CHARA. DISPLAY item on the SETUP menu using the DISPLAY CONTROL.
The DSR-85/85P has two types of alarms: one is for operators while the other is for service persons. This manual describes only the alarms for service persons. For details of alarms for operators, refer to the operating instruction or overview in this manual. Activating the alarm display may influence the system, such as when the reference video signal is not used. Therefore, you can select whether or not to display the alarm from the Setup menu selection. However, the alarms for service persons are displayed regardless of the Setup menu setting.

1. Alarm display when the main power is turned on

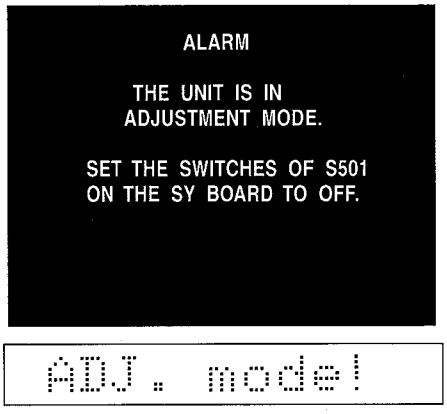
Detection : Checks the settings of switch S201 on the SY-220 board and the contents of non-volatile memory (EEPROM).
Operation after detection : None
Display : The alarm is displayed until any button is pressed.



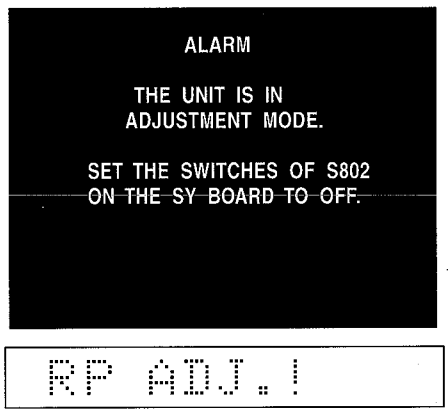
Detection : Checks the version of the Setup menu.
Operation after detection : The Setup menu operates using the factory settings. The contents of the non-volatile memory (EEPROM) remain unchanged. Therefore, if the setting of the Setup menu is not changed, the same alarm will appear when the main power is turned on.
Display : The alarm is displayed until any button is pressed.



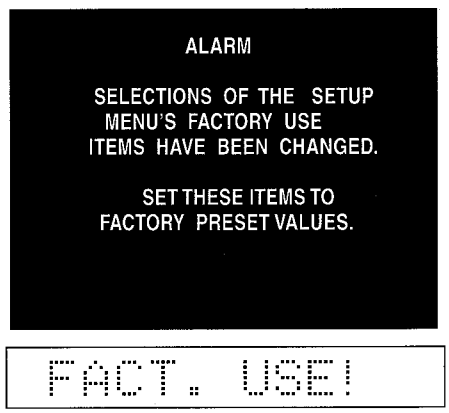
Detection : Checks that switch S501 on the SY-220 board is set to ON.
Operation after detection : None
Display : The alarm is displayed until any button is pressed.



Detection : Checks that switch S802 on the RP-90 board is set to ON.
Operation after detection : None
Display : The alarm is displayed until any button is pressed.

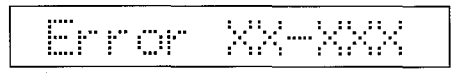


Detection : Checks that the FACTORY USE item of the Setup menu is changed.
Operation after detection : None
Display : The alarm is displayed until any button is pressed.


ALARM
SELECTIONS OF THE SETUP MENU'S FACTORY USE ITEMS HAVE BEEN CHANGED.
SET THESE ITEMS TO FACTORY PRESET VALUES.
FACT. USE!

3-3-2. Error Codes

The DSR-85/85P has a self diagnostics function which detects internal abnormalities. When a problem is detected, an error code is displayed immediately in the time counter block, and details of the error appear on the video monitor.
An error code can be displayed on a monitor by connecting a monitor to the VIDEO 2 (SUPER) OUTPUT connector, and by turning on the CHARA. DISPLAY item on the SETUP menu using the DISPLAY CONTROL.



Note : An error code appears in the column shown by XX-XXX on the video monitor.

When detected, some errors turn the DSR-85/85P to AUTO OFF. (See from page 3-17 of item "4. Error Codes", excluding error code 08-032.)
This error is kept in memory even after the main power of the DSR-85/85P is turned off. In other words, the error code or the contents of the detected error appear even when the main power of the DSR-85/85P is turned off and then back on again, so the DSR-85/85P enters AUTO OFF mode again.

The machine enters the emergency EJECT mode when the [EJECT] key is pressed at this moment. In the emergency EJECT mode, the tape is ejected gently by the motor (if working) assuming that the tape is slack or a device may be faulty.

The following message appears on the video monitor when the machine enters the emergency EJECT mode.
The error code is displayed on the time counter.

The following message appears on the video monitor when a cassette tape is ejected in the emergency EJECT mode. The error code is displayed on the time counter.

The following message appears on the video monitor when a cassette tape cannot be ejected with the emergency EJECT mode. The error code is displayed on the time counter.

Perform step 3-12 when a cassette tape cannot be ejected with the emergency EJECT mode.

1. Main codes and sub codes

• Main codes

The main code is a two-digit number that indicates the system which sensed the error.

Main code 0X : Servo and tape pass system error
Main code 2X : Mechanism control system error
Main code 3X : Sensor error
Main code 91 : Communication system and interface system error
Main code 92 to 94 : Sync. system error
Main code 95 : Digital signal process system error and communication error with ICs

• Sub codes

The sub code is a three-digit number. Each digit has the following meaning.

When the main code is 0X or 2X :

X X X
| | |
| | Third digit : Error symptom
| Second digit : Device which senses abnormality
First digit : Mode which senses abnormality.

First digit : Mode which senses abnormality.

0 : Mode cannot be identified, or mode identification is not necessary.
1 : Cassette down mode
2 : Threading mode
3 : STOP mode
4 : F. FWD or REW mode
5 : SEARCH mode
6 : PLAY or RECORD mode
7 : STANDBY-OFF mode
8 : Unthreading mode
9 : Cassette up mode
A : Cassette out mode
(State that a cassette is ejected.)

Second digit : Device which senses abnormality

0 : Mode cannot be identified, or mode identification is not necessary.
1 : Cassette up/down motor/sensor
2 : Threading motor/FG/sensor
3 : Drum motor/FG
4 : Capstan motor/FG
5 : Supply reel motor/FG
6 : Supply reel brake solenoid
7 : Takeup reel motor/FG
8 : Takeup reel brake solenoid
9 : Supply and takeup reel motor/FG
A : Tension regulator
B : Pinch solenoid
C : Reel position motor/sensor
D : Head cleaner solenoid

Third digit : Error symptom

0 : Mode identification is not necessary.
1 : Operation could not be completed within the specified time.
2 : Abnormal speed detected.
3 : Tape slack detected.
4 : FG cannot be detected.
5 : FG detected.
6 : Rotating direction error detected.
7 : Excessive tension detected.
8 : Abnormal current detected.
9 : The full top or full end of a tape cannot be released.
A : Retry in progress
(Unthreaded once than back to threading again)

When the main code is 3X :

All sub codes are 000.

When the main code is 91:

X X X

Third digit : Error symptom
Second digit : CPU (microprocessor) or IC of the communication counterpart.
First digit : CPU (microprocessor) or IC which detects the abnormality.

First and second digits : CPU (microprocessor) code.
1 : System control main CPU
2 : Keyboard microprocessor
3 : Memory
4 : Servo main CPU
5 : Servo sub microprocessor
6 : TBC microprocessor
7 : SPCON microprocessor
8 : TC IC
E : QSDI interface microprocessor
F : SDI OUT microprocessor

Third digit : Error symptom (when the communication counterpart is other than memory)
1 : Abnormal checksum
2 : Abnormality of overrun
3 : Abnormal parity
4 : Abnormal framing
5 : Communication could not be completed in the specified time.
6 : Abnormality in the servo adjustment data area of EEPROM
7 : Abnormality in the setup menu area of EEPROM
8 : Abnormality in the hours meter area of EEPROM

Third digit : Error symptom (when the communication counterpart is memory)
1 : Abnormality in the external data area
2 : Abnormality in the internal data area
3 : Abnormality in the common memory-1 area
4 : Abnormality in the common memory-2 area
5 : Abnormality in the external serial memory-1 area
6 : Abnormality in the external serial memory-2 area
7 : Abnormality in the external serial memory-3 area
8 : Abnormality in the external serial memory-4 area
9 : Abnormality in the EEPROM area
F : Abnormality of CM

When the main code is from 92 to 94 :

X X X

Third digit : Abnormal signal
Second digit : IC to which the signal is input
First digit : CPU (microprocessor) which detects the abnormality
. . . . .Same as the main code 91

Third digit : Abnormal signal
1 : Reference frame pulse of the output signal (RSG OE)
2 : Reference track pulse of the playback side (P-TRKT1)
3 : Reference frame pulse of the playback side (P-FLTT1)
4 : Reference track pulse of the record side (R-TRKT1)
5 : Reference frame pulse of the record side (R-FLTT1)

When the main code is 95 :

X X X

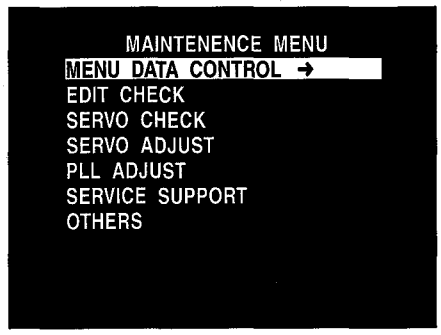
Second and third digits: IC of the communication counterpart. (The second digit indicates the communication line number and the third digit indicates the CS number.)
First digit : CPU (microprocessor) or IC which detects the abnormality.
. . . . .Same as the main code 91

2. Display of previously detected error codes

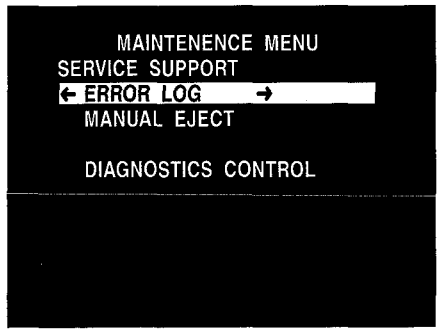
When the DSR-85/85P detects an internal abnormality, the error code is memorized in EEPROM.
(Excluding error code 9X-XXX)
A maximum of 8 error codes detected previously, starting from the latest error code, can be displayed.

The error code history can be displayed.

1. While pressing the [←] key, press the [MENU] key.



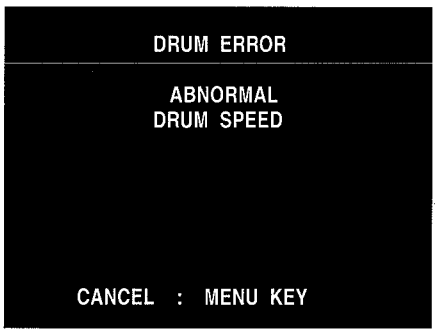
2. Move the cursor to SERVICE SUPPORT so that the letters are highlighted using the [↑], [↓] keys, then press the [→] key.



3. Move the cursor to ERROR LOG so that the letters are highlighted using the [↑], [↓] keys, then press the [→] key.

4. Move the cursor to the desired error code so that the letters are highlighted using the [↑], [↓] keys, then press the [→] key.

5. Press the [SET] ([YES]) key.



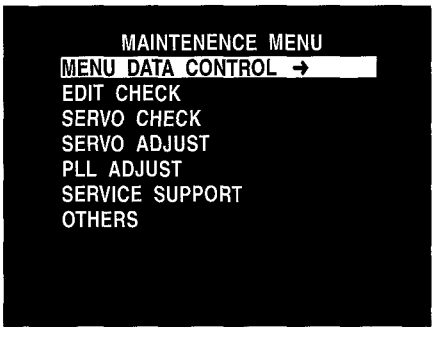
6. Return to the menu of step 3 by pressing the [MENU] key.

3. Retrieval of error code meanings

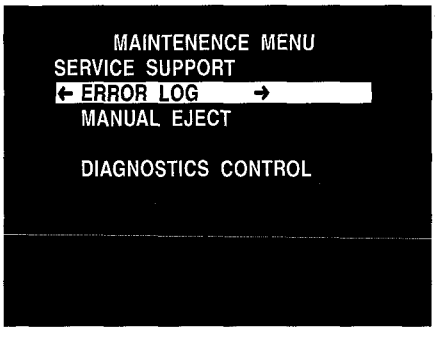
The DSR-85/85P has a dictionary function that describes the meaning of the error codes.

Access the meaning of the error codes as follows :

1. Press the [MENU] key while pressing the [←] key.



2. Move the cursor to SERVICE SUPPORT so that the letters are highlighted using the [↑], [↓] keys, then press the [→] key.

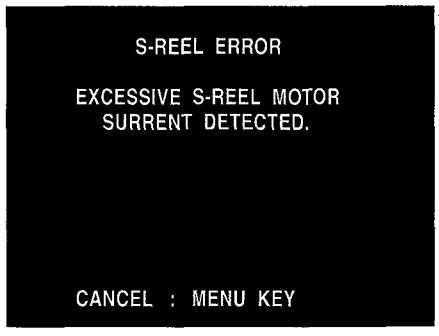


3. Move the cursor to ERROR DIAGNOSTICS so that the letters are highlighted using the [↑], [↓] keys, then press the [→] key.

4. Move the cursor to the main code of the error which you want to access so that the letters are highlighted using the [↑], [↓] keys, then press the [→] key.

5. Move the cursor to the desired error code so that the letters are highlighted using the [↑], [↓] keys, then press the [→] key.

6. Press the [SET] ([YES]) key.



7. Return to the menu of step 4 by pressing the [MENU] key.

4. Error codes

• Main code 0X : abnormality of servo and tape run system

① Main code 02

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
058	Detected an abnormal current in the S reel motor.	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette tape is inserted.
068	Detected an abnormal current in the S reel solenoid.			
078	Detected an abnormal current in the T reel motor.			
088	Detected an abnormal current in the T reel solenoid.			
0B8	Detected an abnormal current in the Pinch solenoid.			
154	Failed to detect the S reel FG by the FG check during cassette tape insertion.	Eject the cassette tape.	–	
174	Failed to detect the T reel FG by the FG check during cassette tape insertion.			
194	Failed to detect both S and T reel FGs by the FG check during cassette tape insertion.			
255	Detected the S reel FG during threading.	AUTO OFF	EJECT (Emergency EJECT)	
274	Failed to detect the T reel FG during threading.			
275	Detected the T reel FG during threading.			
291	Failed to complete winding a tape.			
355	Detected the S reel FG during STOP and STILL.			
375	Detected the T reel FG during STOP and STILL.			
395	Detected both S and T reel FGs during STOP and STILL.			
402	Detected an abnormal tape speed during F. FWD and REW.			
403	Detected slack tape during F. FWD and REW.			
454	Failed to detect the S reel FG during F. FWD and REW.			
474	Failed to detect the T reel FG during F. FWD and REW.			
494	Failed to detect both S and reel FGs during F. FWD and REW.			
496	Detected the abnormal direction of S and T reel rotation during F. FWD and REW.			
503	Detected slack tape during search.			
554	Failed to detect the S reel FG during search.			
574	Failed to detect the T reel FG during search.			
594	Failed to detect the S and T reel FGs during search.			
596	Detected the abnormal direction of S and T reel rotation during search.			
603	Detected slack tape during PLAY and REC.			
654	Failed to detect the S reel FG during PLAY and REC.			
674	Failed to detect the T reel FG during PLAY and REC.			
694	Failed to detect both S and reel FGs during PLAY and REC.			
696	Detected the abnormal direction of S and T reel rotation during PLAY and REC.			
803	Detected slack tape during unthreading.			
855	Failed to detect the S reel FG during unthreading.			
874	Failed to detect the T reel FG during unthreading.			
A55	Detected the S reel FG during cassette eject.	Insertion of a cassette is inhibited until the error is solved.		
A75	Detected the T reel FG during cassette eject.			
A95	Detected both S and T reel FGs during cassette eject.			

② Main code 06

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
6A7	Detected the abnormal tape tension during PLAY and RECORD.	The mode at the time of detection is kept continued. (If the mode is PLAY, PLAY continues.) If mode is changed to other than PLAY and RECORD, machine enters AUTO OFF.	The machine operates normally after the error is solved. The PLAY and RECORD modes continue but other modes are changed to STOP then EJECT (Emergency EJECT).	Displayed until the error is solved and any key is pressed.

③ Main code 07

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
042	Detected the abnormal capstan speed.	STOP	The machine operates normally after the error is solved.	Displayed until any key is pressed.
144	Failed to detect the capstan FG by the FG check during cassette tape insertion.	Ejects a cassette tape.	–	Displayed until the next cassette is inserted.

④ Main code 08

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
03A	Detected the abnormal drum speed. **Video monitor display** 	Retry (The mechanism unthreads once then threads again.)	EJECT	Displayed until the error is solved.
032	The abnormal speed error is not solved.	AUTO OFF	EJECT	Displayed until the next cassette is inserted.

⑤ Main code 09

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
028	Detected the abnormal threading motor current.	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette is inserted.
209	The full top or full end of a tape cannot be released during threading even though short FF or short REW is performed.			
221	Failed to complete threading within the specified time			
224	Failed to detect the threading FG during threading.			
821	Failed to complete unthreading within the specified time			
824	Failed to detect the threading FG during unthreading.			

• Main code 2X : Abnormality related to the mechanism control

① Main code 20

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
018	Detected the abnormal current in the cassette up/down motor.	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette is inserted.
111	Failed to complete the cassette down motion within the specified time.			
911	Failed to complete the cassette up motion within the specified time.			

② Main code 21

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
0C8	Detected the abnormal current in the reel position motor.	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette is inserted.
1C1	Failed to complete the reel position movement within the specified time.	Eject a cassette tape.	–	

③ Main code 22

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
0D8	Detected an abnormal current flowing through the cleaning solenoid.	AUTO OFF	EJECT	Displayed until the next cassette is inserted.

• Main code 3X : Sensor trouble

Sub codes are all 000.

Main code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
30	Detected the tape top and tape end at the same time.	STOP	play, EJECT	Displayed until the error is solved.
31	Failed to release the tape top.	STOP	play, FF, EJECT	
32	Failed to release the tape end.	STOP	play, REW, EJECT	
33	The reel position sensor detected the large and small positions at the same time.	Insertion of cassette tape is inhibited.	–	
34	The threading end sensor and the unthreading end sensor have detected the end at the same time.	Insertion of cassette tape is inhibited.	–	
35	Detected abnormality of the cassette compartment position sensor.	EJECT	–	
36	Detected that the fan motor has stopped.	Insertion of cassette tape is inhibited.	EJECT	

• Main code 91 : Abnormality of communication system or interface system

Main code	Sub code	Contents
91	215	Communication error between system control and keyboard
	145	Communication error between system control and servo
	165	Communication error between system control and TBC
	175	Communication error between system control and SPCON
	1E5	Communication error between system control and QSDI interface
	1F5	Communication error between system control and SDI OUT
	455	Communication error between main servo and drum
	131	System control detected abnormality of external memory.
	132	System control detected abnormality of internal memory.
	133	System control detected abnormality of common memory with servo.
	134	System control detected abnormality of common memory with SPCON.
	431	Servo detected abnormality of external memory.
	731	SPCON detected abnormality of external memory.
	732	SPCON detected abnormality of internal memory.
	733	SPCON detected abnormality of common memory with system control.
	734	SPCON detected abnormality of common memory with servo.
	735	SPCON detected abnormality of SCOM1 memory.
	736	SPCON detected abnormality of SCOM3 memory.
	737	SPCON detected abnormality of SCOM4 memory.
	738	SPCON detected abnormality of SCOM6 memory.
	139	Detected abnormality in the setup menu data area.
	439	Detected abnormality in the servo adjustment data area.
	539	Detected abnormality in the EQ data area.
	13F	Communication error with CM

• Main code 92 to 94 : Abnormality of sync system

Main code	Sub code	Contents
92	101	System control detected abnormality in RSG OE.
	102	System control detected abnormality in P-TRKT1.
	702	SPCON detected abnormality in P-TRKT1.
	703	SPCON detected abnormality in P-FLTT1.
	704	SPCON detected abnormality in R-TRKT1.
	705	SPCON detected abnormality in R-FLTT1.
93	403	Servo detected abnormality in P-FLTT1.
94	405	Servo detected abnormality in R-FLTT1.

• Main code 95 : Communication error with digital process system IC

Main code	Sub code	Contents
95	121	Communication error between system control and CTLG-R MOD
	124	Communication error between system control and CTLG-P MOD
	126	Communication error between system control and CTLG 2
	421	Communication error between servo and TFSQ-P
	422	Communication error between servo and CHCD-P1
	423	Communication error between servo and CHCD-P2
	424	Communication error between servo and CHCD-P3
	425	Communication error between servo and CHCD-P4
	431	Communication error between servo and TFSQ-R
	432	Communication error between servo and CHCD-R1
	433	Communication error between servo and CHCD-R2
	434	Communication error between servo and CHCD-R3
	435	Communication error between servo and CHCD-R4
	511	Communication error between drum and VITABI-A
	512	Communication error between drum and VITABI-B
	513	Communication error between drum and VITABI-C
	514	Communication error between drum and VITABI-D
	515	Communication error between drum and VITABI-E
	711	Communication error between SPCON and NFIL-R
	712	Communication error between SPCON and BLK-R
	713	Communication error between SPCON and COMP-R
	714	Communication error between SPCON and SFY-R1 MS
	715	Communication error between SPCON and SFY-R2 MS
	716	Communication error between SPCON and SFY-R3 MS
	717	Communication error between SPCON and SFY-R4 MS
	718	Communication error between SPCON and QSDI-R

Main code	Sub code	Contents
95	721	Communication error between SPCON and SFY-R1 SP
	722	Communication error between SPCON and SFY-R2 SP
	723	Communication error between SPCON and SFY-R3 SP
	724	Communication error between SPCON and SFY-R4 SP
	731	Communication error between SPCON and AU EDIT
	732	Communication error between SPCON and Fs CONT-R
	733	Communication error between SPCON and DSP-R1
	734	Communication error between SPCON and DSP-R2
	735	Communication error between SPCON and AUD-R1
	736	Communication error between SPCON and AUD-R2
	737	Communication error between SPCON and Fs CONT QSDI
	739	Communication error between SPCON and QSDI CORE R1
	73A	Communication error between SPCON and QSDI CORE R2
	741	Communication error between SPCON and NFIL-P
	742	Communication error between SPCON and BLK-P
	743	Communication error between SPCON and COMP-P
	744	Communication error between SPCON and SFY-P1 MS
	745	Communication error between SPCON and SFY-P2 MS
	746	Communication error between SPCON and SFY-P3 MS
	747	Communication error between SPCON and SFY-P4 MS
	748	Communication error between SPCON and QSDI-P
	751	Communication error between SPCON and SFY-P1 SP
	752	Communication error between SPCON and SFY-P2 SP
	753	Communication error between SPCON and SFY-P3 SP
	754	Communication error between SPCON and SFY-P4 SP
	761	Communication error between SPCON and AU SFY
	762	Communication error between SPCON and JOG
	763	Communication error between SPCON and AU-P1
	764	Communication error between SPCON and AU-P2
	765	Communication error between SPCON and Fs CONT-P
	766	Communication error between SPCON and DSP-P1
	767	Communication error between SPCON and DSP-P2

5. Possible causes of errors

• Possible causes of errors

Main code	02												06
Sub code / Possible causes	403 503 603	574 674 803	554 654	402 454 474	355 375	058 078	154 174 194 255 855 A55 A75 A95	274 874	594 694	494	395	496 596 696	6A7
1. Tape is stuck to the tape running mechanism.	O	O	O	O				O		O			O
2. Tape is loosely wound in the cassette.	O	O	O	O	O						O	O	
3. Cassette tape is not confined properly. (Cassette compartment is unlocked.)	O	O	O	O				O	O	O	O	O	
4. Reel motor does not generate the correct torque.	O	O	O	O	O	O	O	O	O	O	O	O	O
5. Abnormality of reel FG	O	O	O	O	O		O	O	O	O	O	O	O
6. Tension regulator is defective.	O												
7. Cut-and-spliced tape is used.		O	O		O				O		O	O	
8. Top detector and end detector are defective.			O	O					O	O			O
9. Pinch roller has insufficient pressure against capstan.									O			O	

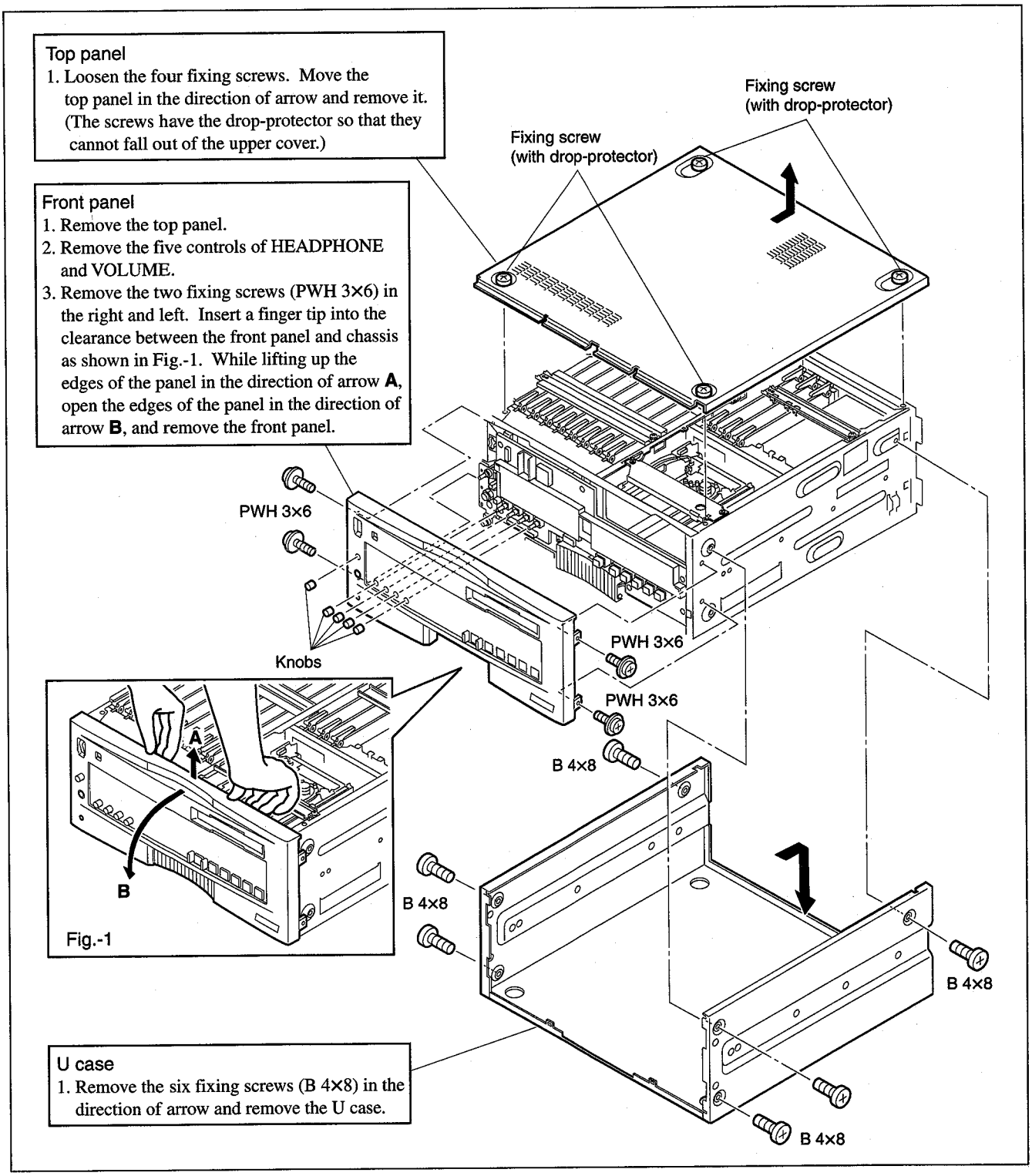
• Check procedure for the possible causes, and the related circuit boards and devices

Possible causes	Check items and check procedure	Related circuit boards and devices
1. Tape is stuck to the tape running mechanism. • Tape is dirty. • Tape run mechanism is dirty. • Humidity or condensation	• Check if tape is stuck to tape guides or drum. • Check if foreign material is adhered to tape. • Check if tape is damaged. • Check if foreign material is adhered to tape run mechanism and drum.	
2. Tape is loosely wound in the cassette. • A tape which has been used for many times, is used. • A damaged tape is used.	• Check if tape has severe non-uniform winding.	
3. Cassette tape is not confined properly. (Cassette compartment is unlocked.)	Check that the four pins of the cassette compartment are inserted into the holes of the slant table. Check that the cassette compartment retainer is securely fastened. ↓ If a cassette compartment is unlocked when a cassette compartment is inserted, exchange the cassette compartment. ↓ When a cassette compartment is lock after it is exchanged, the trouble is caused by the cassette compartment. Otherwise the trouble is caused by the defective drive circuit.	SV-161 board

Possible causes	Check items and check procedure	Related circuit boards and devices
4. Reel motor does not generate the correct torque. • Reel brake has mechanical defect. • Reel brake solenoid is open. • Reel brake solenoid drive IC is defective. • Reel motor is defective. • Reel motor drive circuit is defective. • Harness is defective.	• When the S and T reel brakes are considered to be the cause of trouble : Check the S and T reel brakes. Check that the S and T reel brakes are released. • When the S and T reel motors are considered to be the cause of trouble : Perform the servo adjustment. Confirm that the servo adjustment is completed in success.	When the S reel brake is considered to be the cause of trouble : SV-161 board, RM-159 board S reel brake solenoid When the T reel brake is considered to be the cause of trouble : SV-161 board, RM-160 board T reel brake solenoid
5. Abnormality of reel FG • Reel FG photo sensor is defective. • Harness is defective.	Perform the reel FG adjustment. Confirm that the reel FG adjustment is completed in success.	When the S reel motor or the S reel FG is considered to be the cause of trouble : SY-220 board, SV-161 board, MS-43 board, RM-159 board, SE-315 board, S reel motor, S reel FG sensor GP1A30R When the T reel motor or the T reel FG is considered to be the cause of trouble: SY-220 board, MS-43 board, RM-160 board, SE-316 board, T reel motor, T reel FG sensor GP1A30R
6. Tension regulator is defective.	Perform the hook adjustment. Confirm that OK appears on display.	TR-93 board, PTC-86 board, MS-43 board, SY-220 board, tension sensor DM230
7. Cut-and-spliced tape is used.		
8. Top detector and end detector are defective.	Check the tape top and tape end. The top and end sensor must turn on and off correctly.	When the tape top sensor is considered to be the cause of trouble : PTC-85 board, PTC-87 board, MS-43 board, SY-220 board, SS-53 board, tape top sensor When the tape end sensor is considered to be the cause of trouble: PTC-86 board, MS-43 board, PTC-87 board, SY-220 board, tape end sensor
9. Pinch roller has insufficient pressure against capstan. • Pinch roller has mechanical defect. • Pinch solenoid is open. • Pinch solenoid drive IC is defective.	Check the pinch roller. Pinch roller must be pressed against the capstan shaft correctly.	PTC-84 board, MS-43 board, SV-161 board, pinch solenoid

3-4. REMOVAL AND ATTACHMENT OF THE CABINET

Be sure to remove the cabinet after turning off the power switch.


Top panel
1. Loosen the four fixing screws. Move the top panel in the direction of arrow and remove it. (The screws have the drop-protector so that they cannot fall out of the upper cover.)
Front panel
1. Remove the top panel.
2. Remove the five controls of HEADPHONE and VOLUME.
3. Remove the two fixing screws (PWH 3×6) in the right and left. Insert a finger tip into the clearance between the front panel and chassis as shown in Fig.-1. While lifting up the edges of the panel in the direction of arrow A, open the edges of the panel in the direction of arrow B, and remove the front panel.
U case
1. Remove the six fixing screws (B 4×8) in the direction of arrow and remove the U case.
Fixing screw (with drop-protector)
Fixing screw (with drop-protector)
PWH 3×6
Knobs
PWH 3×6
PWH 3×6
B 4×8
B 4×8
B 4×8
B 4×8
A
B
Fig.-1

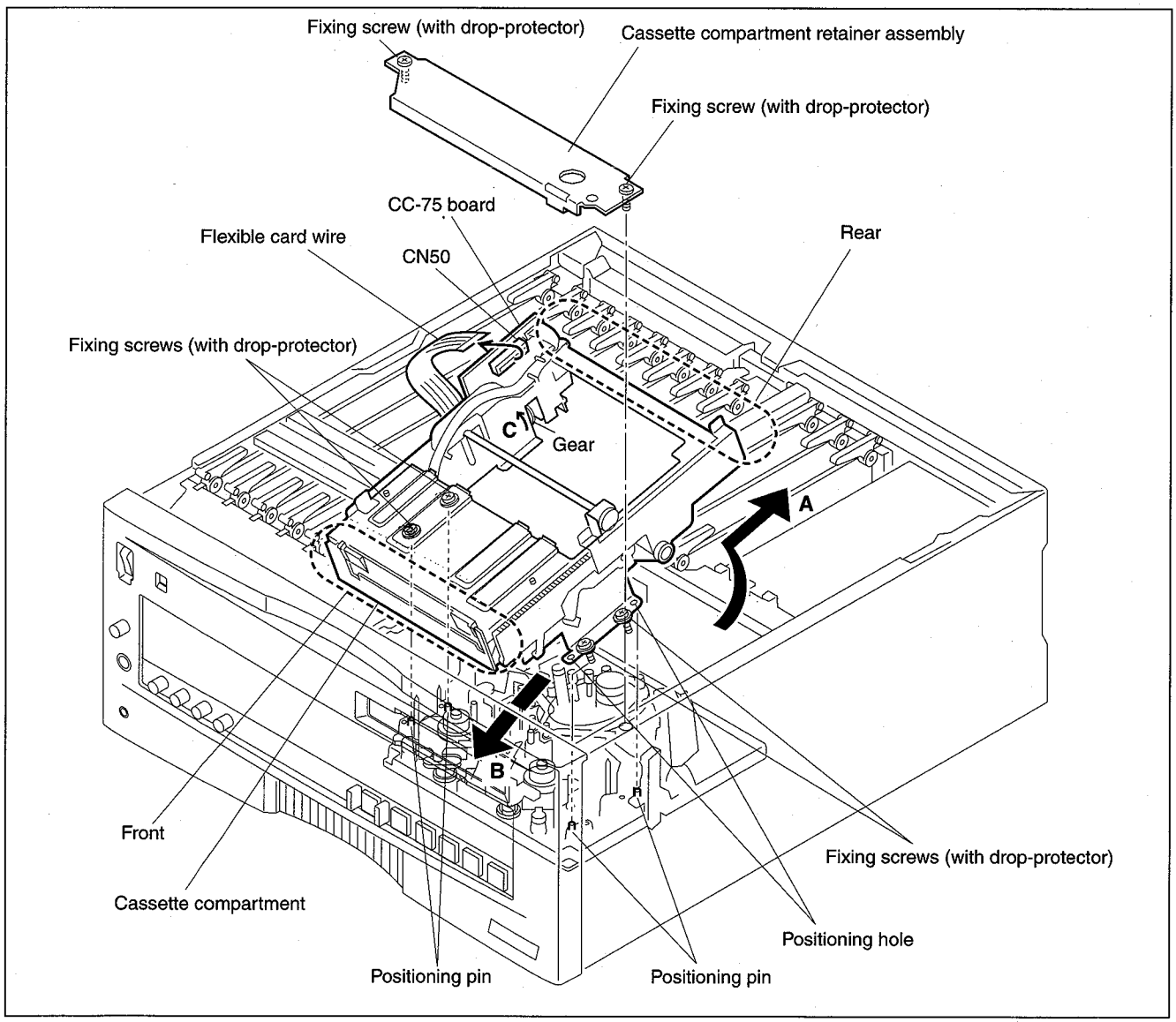
3-5. REMOVAL AND ATTACHMENT OF THE CASSETTE COMPARTMENT

Removal

1) Remove the top panel. (Refer to section 3-4.)
2) Pull the flexible card wire out of the connector (CN50) on the CC-75 board.
3) Remove the cassette compartment retainer assembly by loosing the 2 screws.
   The screw cannot fall out of the cassette compartment retainer assembly because it has a drop-protector.
4) Loosen the four screws fixing the cassette compartment.
   The screw cannot fall out of the cassette compartment because it has a drop-protector.
5) Rotate the gear of the cassette compartment in the direction of arrow **C** and back the rack about 5 mm. Remove the cassette compartment in the direction of arrow **A**.

Attachment

6) Insert the front side of the cassette compartment from the angled **B** direction, and down the rear side of the cassette compartment.
7) Reverse the removal procedure from steps 3) to 1) to attach the cassette compartment.
   - The cassette compartment is positioned by the four positioning pins. Tighten the screws after ensuring that these pins are correctly inserted in each hole.

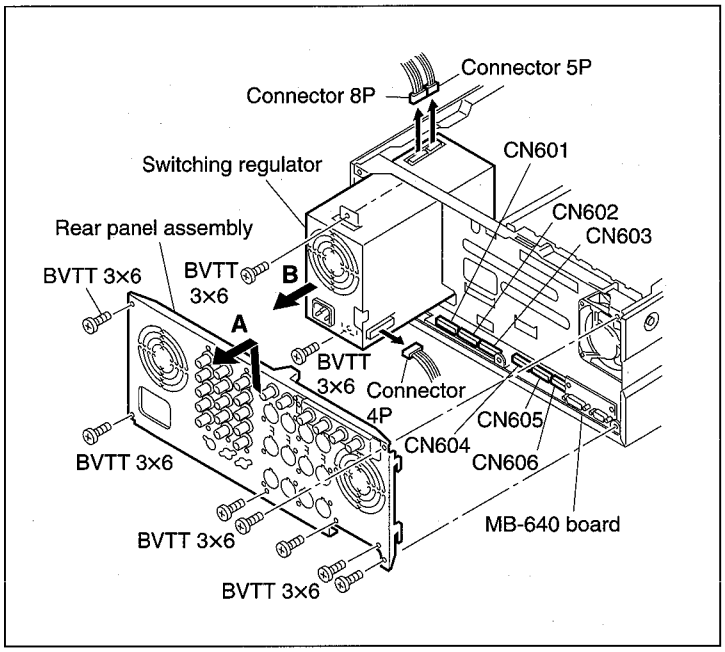


3-6. REMOVAL OF THE SWITCHING REGULATOR

Note : The switching regulator is in the primary circuit. Take care to avoid electric shocks when removing the switching regulator for replacement or other reasons.
Wait for at least 10 minutes after turning the power off before starting work to avoid the risk of electric shock.

1. Remove the two connectors (8 pins and 5 pins) of the switching regulator.
2. Remove the seven fixing screws (BVTT 3×6) and raise both sides of the rear panel firmly in the direction of the arrow **A** simultaneously to remove the switching regulator.
3. Remove the two fixing screws (BVTT 3×6), pull out the switching regulator in the direction of the arrow **B** and remove the connector (4 pins). Remove the switching regulator.

Note : Make sure that the connectors on the board of the rear panel are inserted into 6 connectors (CN601 to CN606) on the MB-640 board when ATTACHMENT the rear panel.

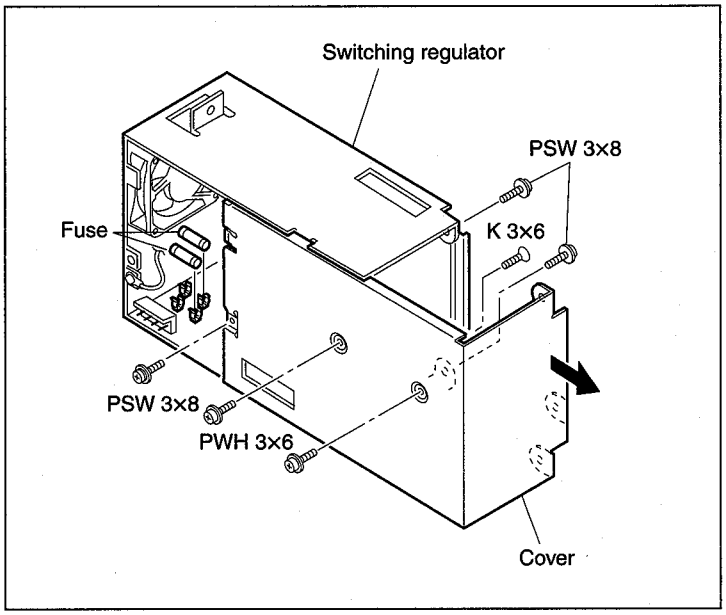


3-7. REPLACEMENT OF THE FUSE

Note : A fuse is mounted on the circuit board in the switching regulator.
If the DSR-85/85P has abnormality and excessive current flows, the fuse may blow. Replace the fuse after checking the cause of the abnormality.

1. Remove the switching regulator. (Refer to section 3-6.)
2. Remove the fixing screws (PWH 3×6 2 pieces, PSW 3×8 3 pieces and K 3×6 1 piece) and remove the cover of the switching regulator in the direction of the arrow.
3. Remove the fuse from the fuse holder and replace it with a new fuse.

SONY parts No. :
1-532-748-11 6.3A, 125 V for NTSC
1-532-325-00 T6, 3A, 250 V for PAL



3-8. EXTENSION BOARD

An optional extension board is supplied to check and adjust the card boards. Attach the extension board to DSR-85/85P and attach the board to be checked and adjusted to the top of the extension board.

Extension board	Card boards which can be connected
DJ-156	EQ-57, RP-90, SV-161
DJ-157	SY-220, DEN-5/5P, SDI-8, DV-16, DD-31, DA-120, AU-238, DDE-4/4P

3-9. REMOVAL AND ATTACHMENT OF THE BOARDS

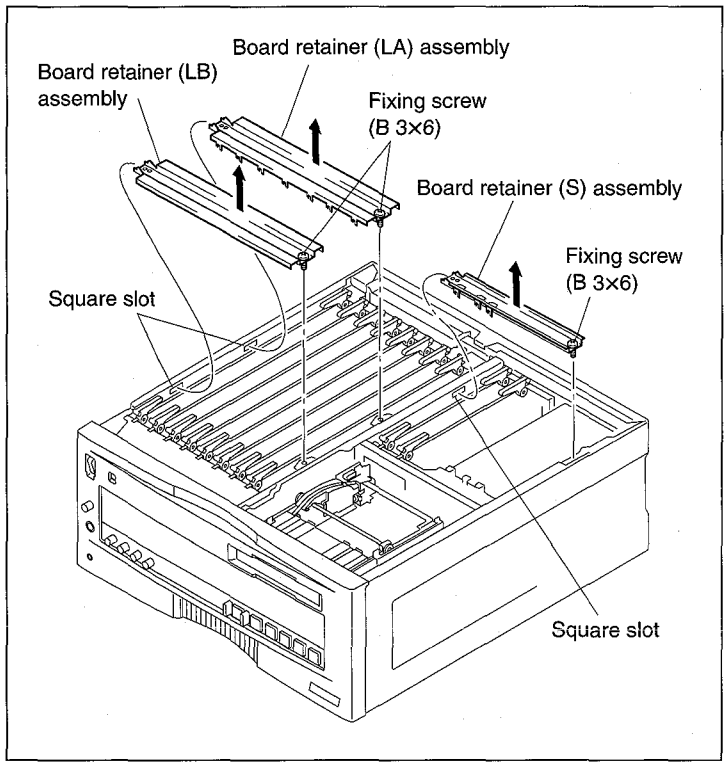
Be sure to remove the board after turning off the power.

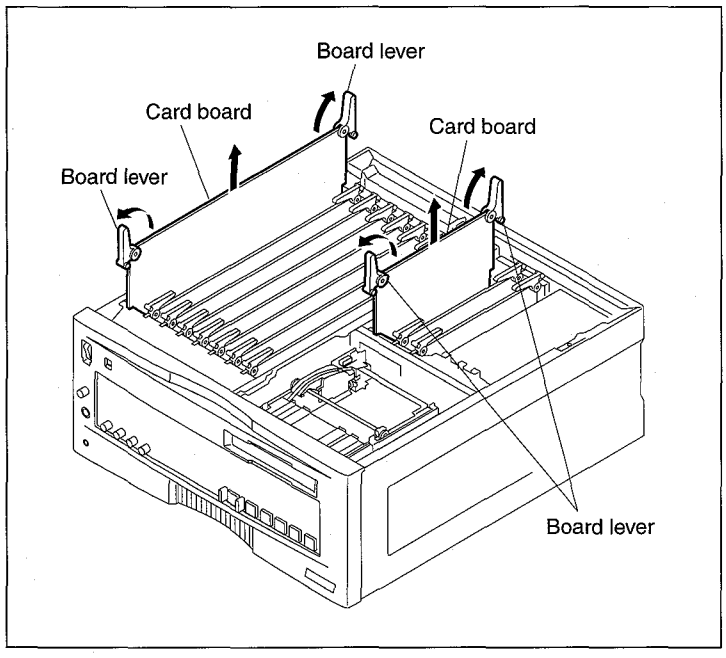
3-9-1. Removal of the Card Boards

1. Remove the top panel. (Refer to section 3-4.)
2. Loosen the screws shown in the figure and remove the board retainer fixtures.
   - The screw has a drop-protector so that it cannot fall out of the board retainer fixtures.
3. Push up the board lever in the direction of the arrow and raise it upwards.

Note when attaching board :

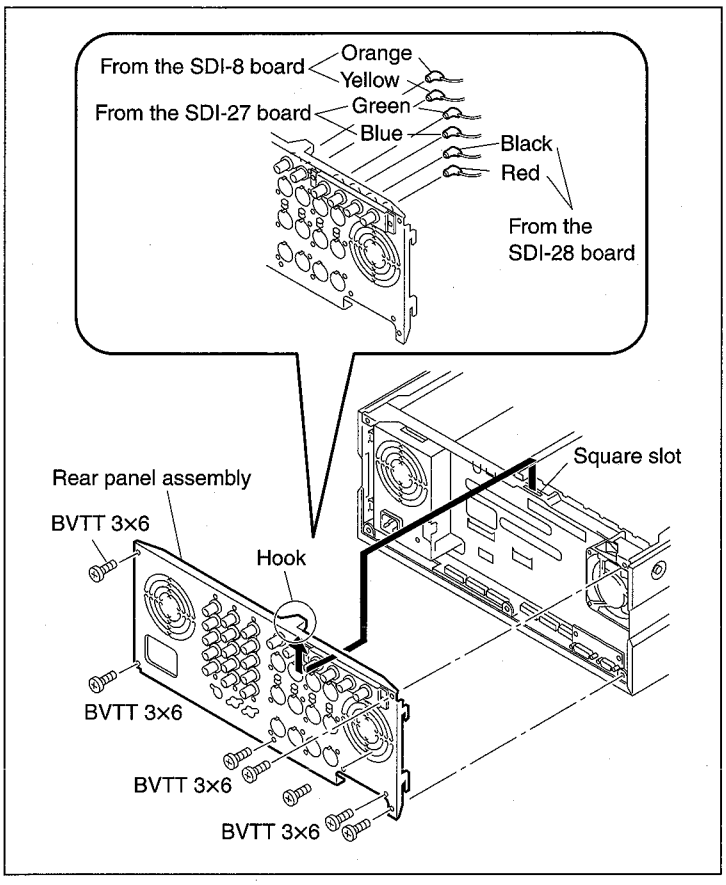
- **Insert the board along the board guide rails until it connects firmly with the connector of the mother board.**
- **Set the board to claws of board retainer firmly.**

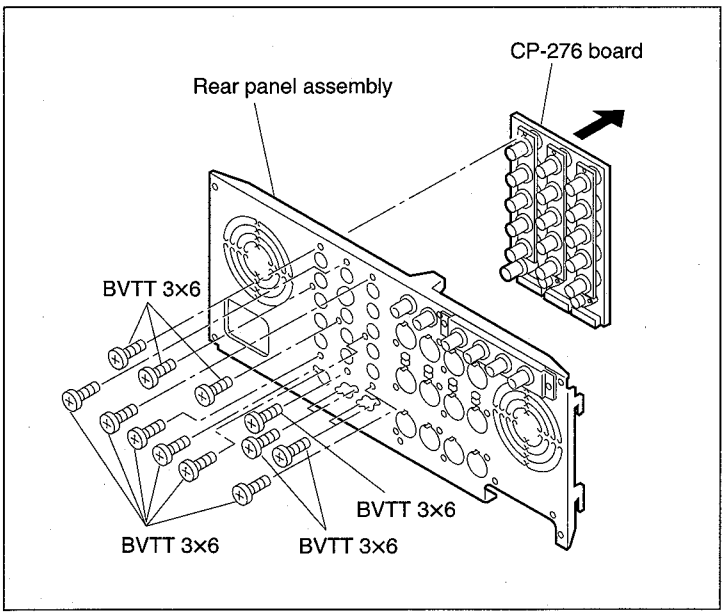




3-9-2. Removal of the CP-276 Board

1. Remove the top panel. (Refer to section 3-4.)
2. Remove the following connectors ; two connectors (orange, yellow) coming from the SDI-8 board, two connectors (green, blue) coming from the SDI-27 board and two connectors (black, red) coming from the SDI-28 board. (* SDI-27/28 boards are option.)
3. Remove the seven fixing screws (BVTT 3×6) to remove the rear panel assembly in the direction of the arrow.
4. Remove the fourteen fixing screws (BVTT 3×6) to remove the CP-276 board in the direction of the arrow.

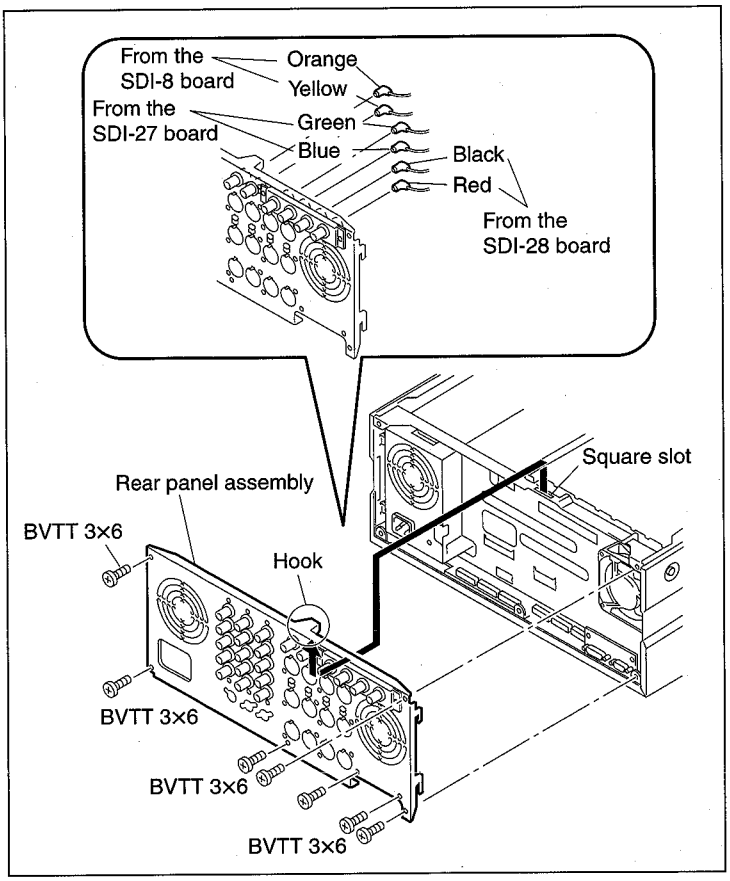


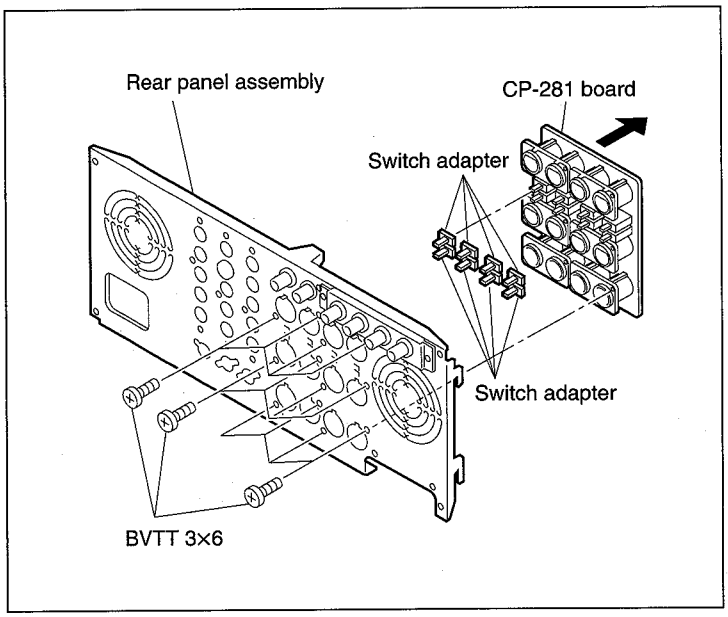


3-9-3. Removal of the CP-281 Board

1. Remove the top panel. (Refer to section 3-4.)
2. Remove the following connectors ; two connectors (orange, yellow) coming from the SDI-8 board, two connectors (green, blue) coming from the SDI-27 board and two connectors (black, red) coming from the SDI-28 board. (* SDI-27/28 boards are option.)
3. Remove the seven fixing screws (BVTT 3×6) to remove the rear panel assembly in the direction of the arrow.
4. Remove the twelve fixing screws (BVTT 3×6) to remove the CP-281 board in the direction of the arrow.

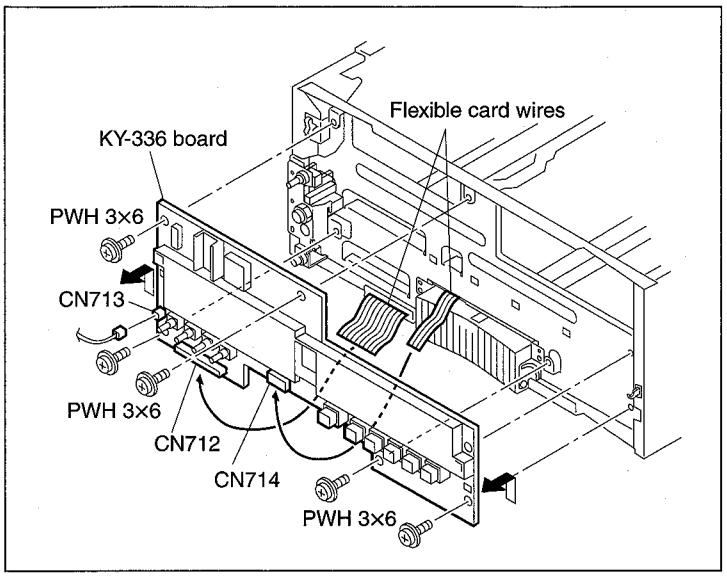
Note : Remove the eight switch adapters attached to the old board and attach them again to the new board.





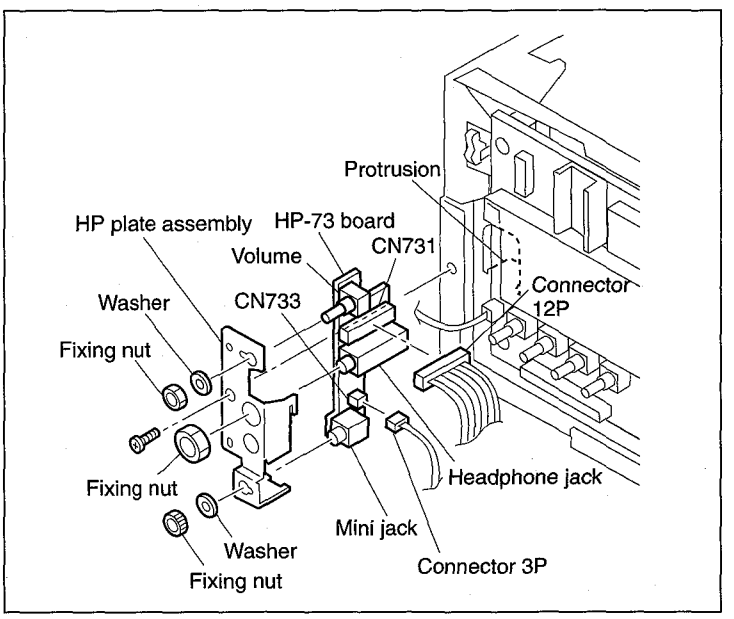
3-9-4. Removal of the KY-336 Board

1. Remove the front panel assembly. (Refer to section 3-4.)
2. Remove one connector (CN713) on the KY-336 board and the flexible card wires CN712 and CN714.
3. Remove the six fixing screws (PWH 3×6) and remove the KY-336 board in the direction of arrow.



3-9-5. Removal of the HP-73 Board

1. Remove the front panel assembly. (Refer to section 3-4)
2. Remove one fixing screw (BVTT 3×6) and remove the HP plate assembly in the direction of the arrow.
3. Remove the two connectors (CN731 and CN733) on the HP-73 board.
4. Remove the fixing nut and washer of the mini jack.
5. Remove the fixing nut and washer of the volume control.
6. Remove the fixing nut of the head phone jack.



3-9-6. Removal and Attachment of the FP-75 Board

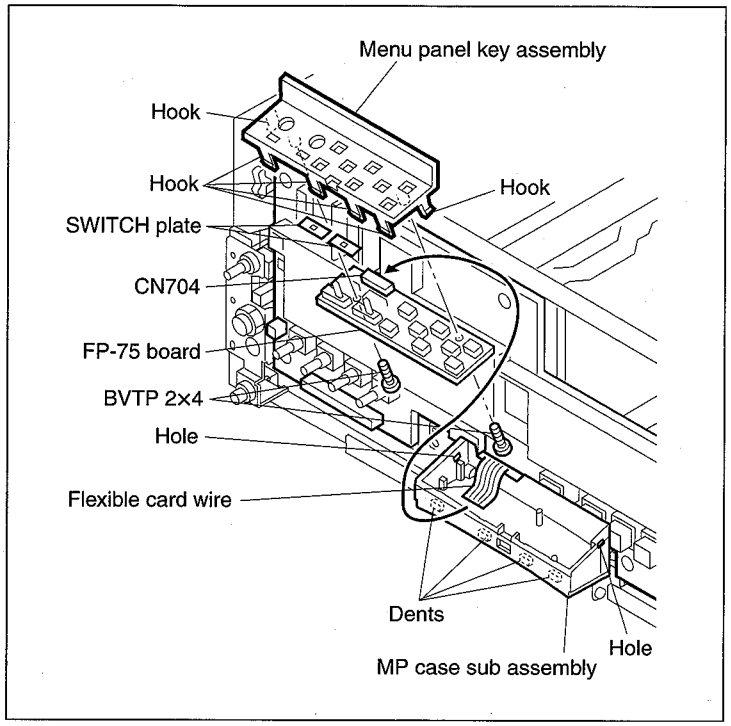
Removal

1. Remove the front panel assembly.
2. Open the MP case sub assembly.
3. Unlock the left and right hooks of the menu panel key assembly and remove it from the case.
4. Pull out the flexible card wire (CN704) connected with the FP-75 board.
5. Remove the two fixing screws (BVTP 2×4) to remove the FP-75 board.

Note : Remove the two SWITCH plates attached on the old board and attached them to the new board.

Attachment

6. Reverse the removal procedure of steps 5 and 4 .
7. While attaching the four hooks on the front of the menu panel key assembly to the recessed portion of the MP case sub assembly, and attach the menu panel key assembly.



3-10. EJECT PROCEDURE OF A CASSETTE TAPE WHEN THERE IS TAPE SLACK (MANUAL EJECT)

Be careful not to damage the tape when taking the cassette tape out.

• If an error is detected :

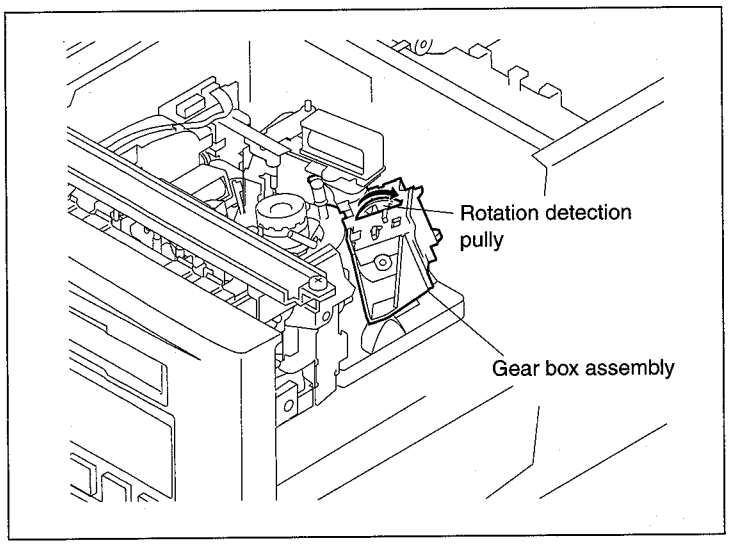
1. Press the [EJECT] key to enter Emergency EJECT mode (Refer to section 3-3) and take the cassette tape out.

• If the cassette tape cannot be taken out with the procedure described above :

1. Enter the SERVICE SUPPORT mode and select MANUAL EJECT referring to section 4, "Maintenance menu."
2. Follow the instructions on the monitor to take out the cassette tape.

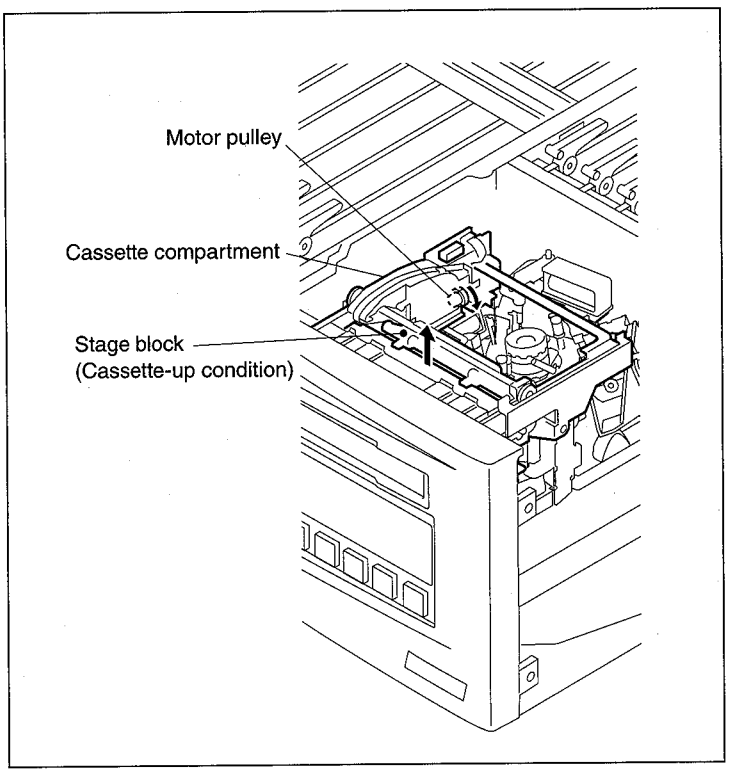
① When the following message appears, turn the rotation detection pulley of the gear box assembly by hand in the direction of the arrow.

```
MANUAL EJECT
THE THREADING RING
DOES NOT FUNCTION.
MOVE THE THREADING RING
TO ITS UNTHREADING
POSITION UNTIL THE NEXT
INSTRUCTION APPEARS.
T-REEL MOTOR WILL REWIND
THE TAPE.
MOTOR LOCKED :   NO KEY
NO CHANGE :  YES KEY
CANCEL : MENU KEY
```



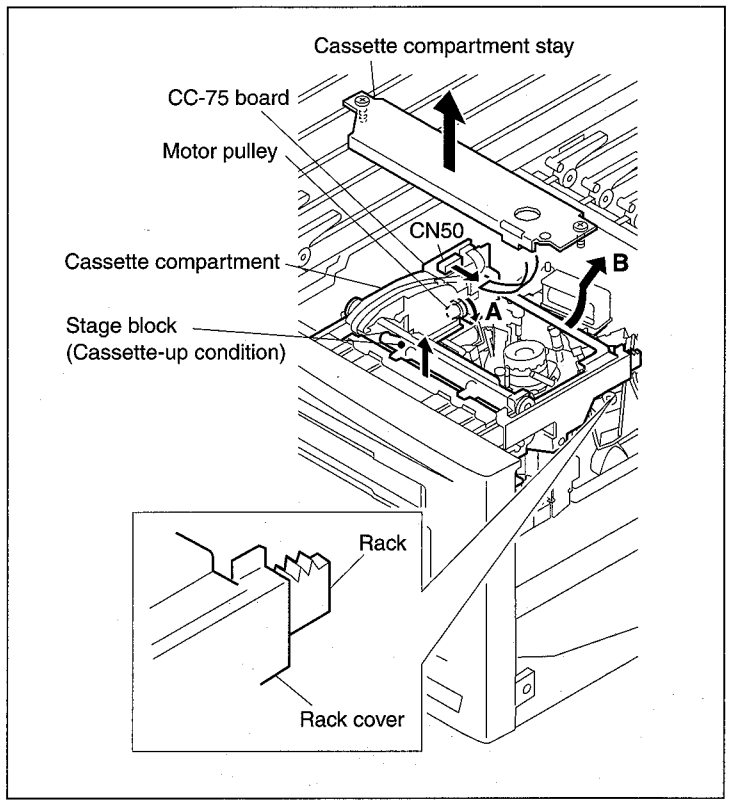
② When the following message appears, turn the motor pulley in the direction of the arrow and raise the cassette compartment to take the tape out.

```
MANUAL EJECT

TURN THE POWER OFF
AND MOVE THE CASSETTE
COMPARTMENT UP,
THEN TAKE OUT
THE CASSETTE TAPE.


CANCEL : MENU KEY
```

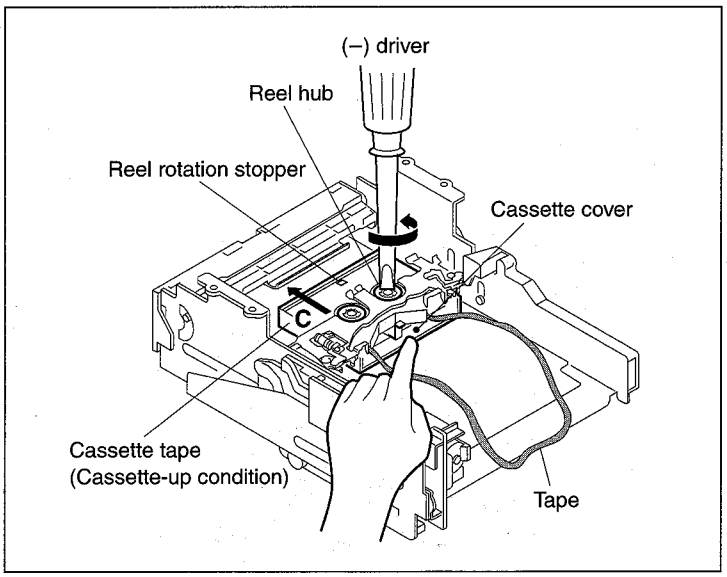


- **The procedure to take out the cassette tape after removing the cassette compartment**

1. Turn the power switch off.
2. Remove the top panel. (Refer to section 3-4.)
3. Remove the cassette compartment stay.
4. Remove the one connector (CN50) from the CC-75 board in the cassette compartment.
5. Turn the motor pulley in the direction of the arrow **A** until the rack enters inside the rack cover.
6. While taking care not to close the cassette lid, raise the rear of the cassette compartment and remove the cassette compartment in the direction of the arrow **B**.



7. While releasing the reel rotation stopper of the cassette, turn the reel hub with (−) driver to rewind the tape and shut the cassette cover.
   Note : Be careful that the cassette must not slide in the direction of the arrow C when releasing the reel rotation stopper.
8. Take the cassette tape out of the cassette compartment.
9. Turn the motor pulley mentioned in the above step 5 so that the cassette is completely out of the cassette compartment.
10. Attach the cassette compartment to the unit.
11. Connect the connector (CN50) and attach the cassette compartment stay.



3-11. HEAD CLEANING WHEN HEAD CLOGGING OCCURS

Clean the video head as follows when the head gets dirty.

• Procedure to use the cleaning cassette

1. Insert the cleaning cassette DVM12CL in the DSR-85/85P and press the [PLAY] key immediately (within 1 second).
   Make sure that the [EJECT] key flashes, the [PLAY] key lights and the display appears.
   Note :
   - **Use only the DVM12CL cleaning cassette tape.**
     If another cleaning cassette tape is used, abnormal abrasion or breakage of the video head could occur.
   - **Press the [PLAY] key immediately after inserting the cleaning cassette tape.**
2. The cleaning cassette tape is automatically ejected after running for 10 seconds.

Note : Do not rewind the cleaning cassette tape to use it again.

3. Make sure that the head is no longer dirty.
   If the video head is still dirty after step 2 above, clean the video head as follows.

• Procedure to use the cleaning cloth

1. Soak the cleaning cloth with cleaning liquid and bring it into contact lightly with the video head.
2. Turn the upper drum slowly by hand in the rotating direction of the head (counterclockwise when viewed from the top) to clean the video head.
   Note :
   - **Never move the cleaning cloth in the vertical direction against the video head because it may break the head.**
   - **Turn the power switch off when cleaning the video head.**

3-12. OPERATING THE VTR WITHOUT A CASSETTE TAPE

When adjusting the mechanical block, the VTR is sometimes operated without a cassette tape. This section describes how to do this.

1. Remove the cassette compartment from the DSR-85/85P or remove the connector of the cassette compartment.
2. Turn on switches S501-3 and 4 of the SY-220 board, then turn on the main power.

Note : If switch S501-3 of the SY-220 board is not on, an error will occur.

The operating method of each mode is as follows.

- THREADING
  After the reel motor and the upper drum rotate, the threading ring rotates to enter the threading mode. The tension arm and the threading ring move to the specified position, then the threading is completed. This condition in which the threading is completed is referred to as the STOP status.

- PLAY
  Press the [PLAY] key.
  The pinch roller is pressed against the capstan shaft to enter the PLAY status.
  When the [PLAY] key is pressed during threading, the pinch roller is pressed against the capstan shaft to enter the PLAY status after the threading has completed.

- FF
  Press the [F · FWD] key.
  The pinch roller is pressed against the capstan shaft to set the FWD.SEARCH to five-times speed.

- REW
  Press the [REW] key.
  The pinch roller is pressed against the capstan shaft to set REV.SEARCH to five-times speed.

- REC
  - When the reel table is on the S position :
    While pressing the record proof switch on the right side of the T side reel table, press both the [PLAY] key and the [REC] key.
    The pinch roller is pressed against the capstan shaft to enter REC status.
    When the record proof switch is released, the REC status is released and the recorder returns to PLAY status.
  - When the reel table is on the standard position:
    While pressing the record proof switch on the right side of the T side reel table, press both the [PLAY] key and the [REC] key.
    The pinch roller is pressed against the capstan shaft to enter REC status.
    When the record proof switch is released, the REC status is released and the recorder returns to PLAY status.

- UNTHREADING
  Press the [EJECT] key.
  The threading ring rotates to enter the unthreading mode.
  The threading ring moves to the specified position to complete the unthreading.

Note : Make sure to turn off switches S501-3 and 4 on the SY-220 board after the adjustment.

3-13. NOTES ON SPARE PARTS

3-13-1. Notes on Spare Parts

(1) Safety Related Components Warning

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

(2) Standardization of Parts

Repair parts supplied from Sony Parts Center may not be always identical with the parts which actually in use due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts".

This manual's exploded views and electrical spare parts list are indicating the part numbers of "the standardized genuine parts at present" .

(3) Stock of Parts

Parts marked with "o" SP (Supply Code) column of the spare parts list are not normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

(4) Units for Capacitors, Inductors and Resistors

The following units are assumed in schematic diagrams, electrical parts list and exploded views unless otherwise specified.

Capacitors : μF
Inductors : μH
Resistors : Ω

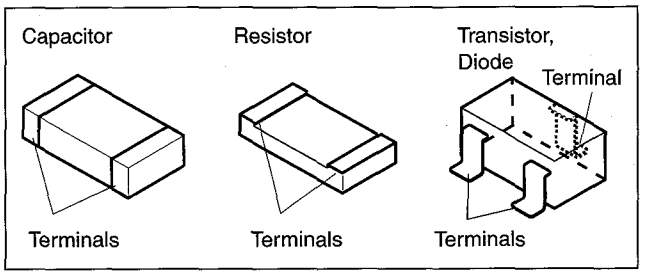
3-13-2. Replacement Procedure for Chip Parts

Tools required

Soldering iron : 20 W
If possible, use a soldering-iron tip heat-controller set to 270 ±10 °C.
Braided wire (Desodering metal braid) :
SOLDER TAUL or equivalent
Sony part No. : 7-641-300-81
Solder : 0.6 mm dia. is recommended.
Sharp-pointed tweezers

Soldering conditions

Soldering iron temperature : 270 ±10 °C
Soldering time : two seconds per pin



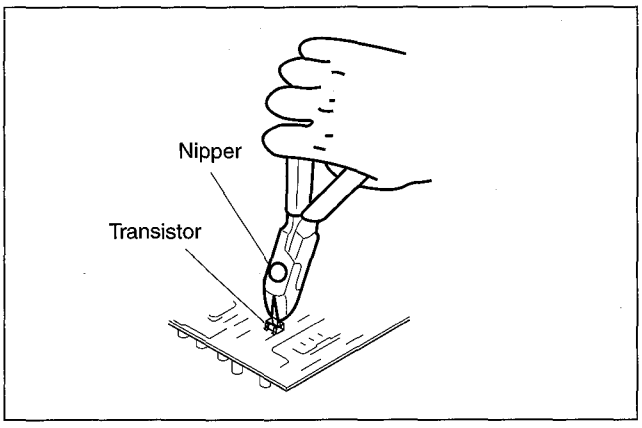
• Resistor and Capacitor Replacement

(1) Place the soldering-iron tip onto the chip part and heat it up until the solder melts.
When the solder melts, slide the chip part aside.
(2) Make sure that there is no pattern peeling, damage and/or bridging around the desoldering position.
(3) After removing the chip part, presolder the area in which the new chip is to be placed with a thin layer of solder.
(4) Place new chip part in position and solder both ends.

Note : Once a chip part has been removed never use it again.

• Transistors and Diodes Replacement

(1) Cut the terminals of the chip part with nippers.
(2) Remove the cut leads as above.
(3) Make sure that there is no pattern peeling, damage and/or bridging around the desoldering positions.
(4) After removing the chip part, presolder the area in which the new chip part is to be placed, with a thin layer of solder.
(5) Place new chip part in position and solder the terminals.



• IC Replacement

(1) Use the braided wire, remove the solder around the pins of the IC-chip.
(2) While heating up the pins, remove them one by one using sharp-pointed tweezers.
(3) Make sure that there is no pattern peeling, damage and/or bridge around the desoldering position.
(4) After removing the chip part, presolder the area in which the new chip part is placed with a thin layer of solder.
(5) Place new chip part in the desired position and solder the pins.

3-13-3. Replacement of the Flexible Card Wire

The following flexible card wires are used in DSR-85/85P. Take utmost care when handling the flexible card wires because their life is extremely shortened by folding.

Destination	Number of pins	Number of flexible card wires
CC-75 board – MB-640 board	13 pins	a piece
KY-336 board – FP-75 board	11 pins	a piece
KY-336 board – MB-640 board	36 pins	a piece
MS-43 board – MB-640 board	36 pins	two pieces
MS-43 board – RM-159 board	9 pins	a piece
MS-43 board – RM-160 board	9 pins	a piece
MS-43 board – capstan motor	15 pins	a piece
MS-43 board – drum	15 pins	a piece
MS-43 board – cassette memory terminal assembly	8 pins	a piece
PRE-32 board – MB-640 board	26 pins	a piece
REC-32 board – MB-640 board	34 pins	a piece
REC-32 board – drum	15 pins	a piece
PRE-32 board – drum	11 pins	two pieces

< ZIF type connector >

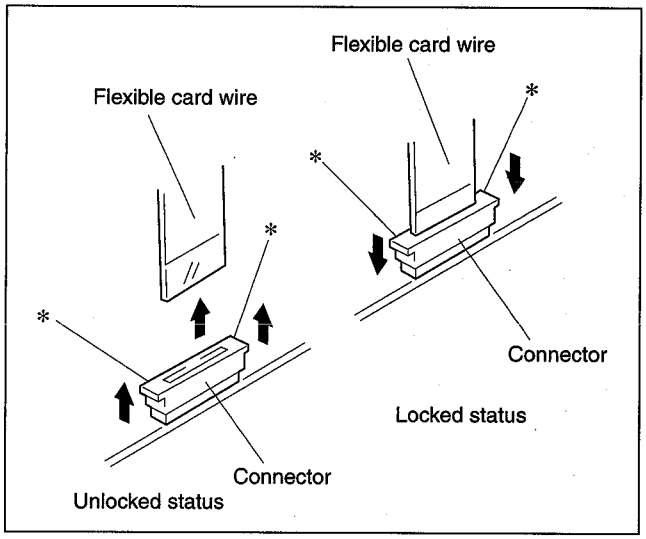
Removal of the ZIF type connector

Raise the marked portions of the connector and unlock the lock to pull out the flexible card wires.

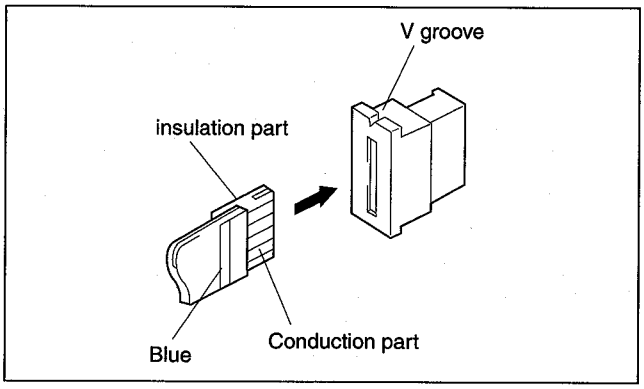
Connection of the ZIF type connector

Insert the flexible card wires fully up to the marked line and push up the marked portions of the connectors.

* Make sure to insert and remove the wires that have no locking mechanism according to the above described procedure.



Note : The flexible card wire has the conduction part and the insulation part. Connect the flexible card wire after checking them as shown in the figure.
If the conduction part and insulation part are connected in the wrong direction, the circuit will not operate.

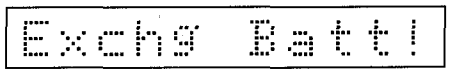


3-14. REPLACEMENT OF LITHIUM BATTERY

The SY-220 board has the built-in lithium battery as the countermeasure for power failure. The lithium battery is attached on top of IC314 (M-2). Life of the lithium battery is about six years.

Time to exchange the battery is displayed in the time counter display block and on the monitor display. Replace the battery when the following message appears.

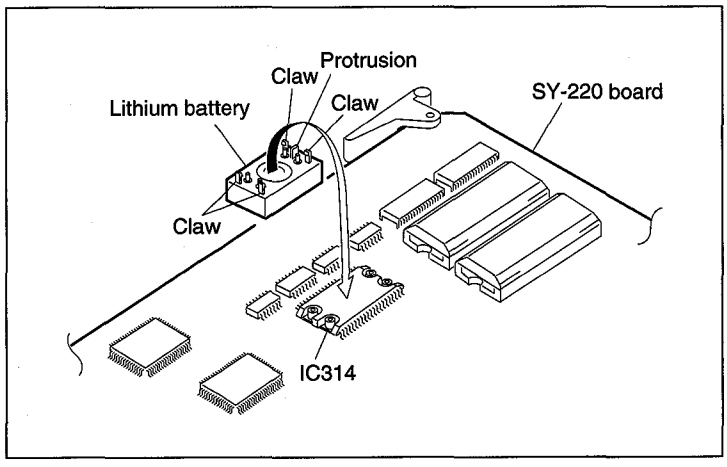
Time counter display block



Sony part number : 1-528-749-11
Type : M4Z28BR00SH1

Note for replacement

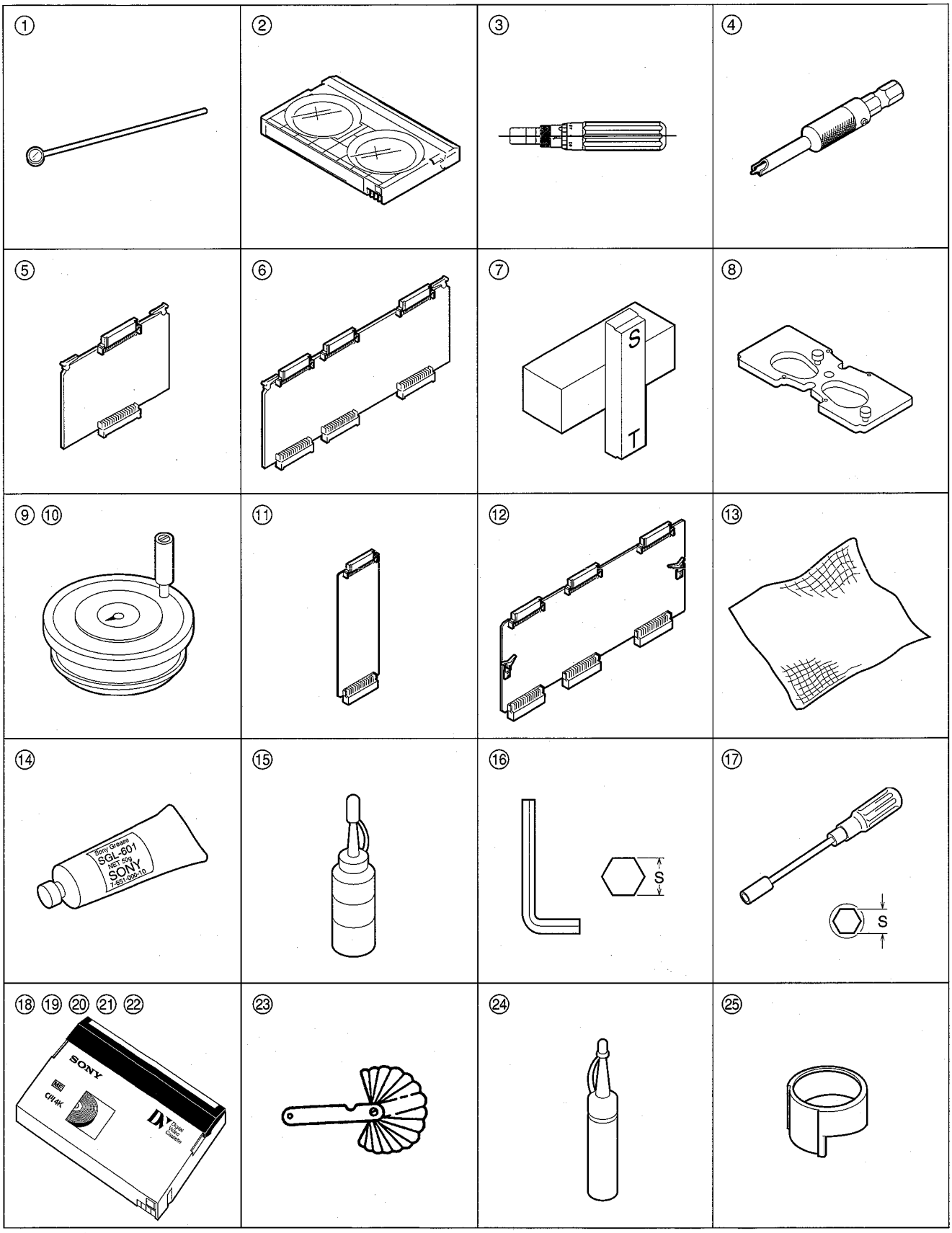
Attach the replacement lithium battery so that the protrusion of the lithium battery is directed in the arrow direction as shown, and the battery is firmly secured by the four claws.



3-15. TOOLS FOR ADJUSTMENT

Drawing No.	Parts No.	Name	Uses
①	J-6080-029-A	Small Dental Mirror	Tape pass adjustment
②	J-6082-373-A	DV torque cassette	FWD/REV back tension adjustment
③	J-6325-400-A	Torque Driver (3 kg/cm)	Fixing screws
④	J-6440-850-A	Tape Guide Adjustment Driver	Tape guide height adjustment
⑤	J-6441-560-A	Extension Board, DJ-156 (DSR-85)	Adjusting the SV/EQ/RP boards
⑥	J-6441-570-A	Extension Board, DJ-157 (DSR-85)	Adjusting the AU/DA/DD/DDA/SDI/DV/ DEN/SY boards
⑦	J-6442-570-A	Reel Table Height Gauge	Reel table adjustment
⑧	J-6442-470-A	Reel Table Reference Plate	Reel table adjustment
⑨	J-6442-170-A	Break Torque Gauge (CW)	Brake torque adjustment
⑩	J-6442-460-A	Break Torque Gauge (CCW)	Brake torque adjustment
⑪	J-6442-610-A	Extension Board, DJ-259 (DSR-80/60)	Adjusting the RP board
⑫	J-6442-620-A	Extension Board, DJ-260 (DSR-80/60)	Adjusting the DV/IO/SY/SV boards
⑬	3-184-527-01	Cleaning Cloth	Cleaning (15×15 cm)
⑭	7-651-000-10	Grease, SGL-601 (NET 50 g)	For lubrication of general mechanism parts
⑮	7-661-018-18	DIAMOND OIL NT-68	For lubrication of general mechanism parts
⑯	7-700-736-06	L Shaped HexagonWrench (S=0.89 mm)	Reel table adjustment
⑰	7-700-751-01	Nutdriver (S=4.5 mm)	Tape path adjustment
⑱	8-967-999-02	Alignment Tape, XH2-1AST	Tape path adjustment
⑲	8-967-999-22	Alignment Tape, XH5-1A2	Electrical adjustment (NTSC)
⑳	8-967-999-26	Alignment Tape, XH5-1AP2	Electrical adjustment (PAL)
㉑	8-967-999-31	Alignment Tape, XH4-1A	Electrical adjustment (NTSC)
㉒	8-967-999-35	Alignment Tape, XH4-1AP	Electrical adjustment (PAL)
㉓	9-911-053-00	Thickness Gauge	Thickness adjustment
㉔	9-919-573-01	Cleaning LIQUID	Cleaning
㉕	J-6443-360-A	D Cover	For protect drum

S = double width (width across flat)



S = double width (width across flat)

3-16. SAFETY CHECK-OUT (UC MODEL ONLY)

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

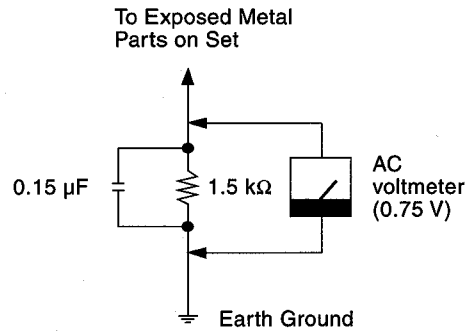


Fig A. Using an AC voltmeter to check AC leakage.

SECTION 4
MAINTENANCE MENU

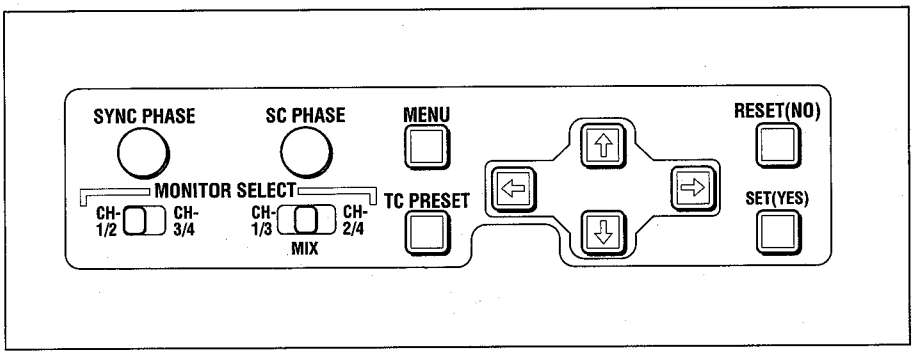
The DSR-85/85P has a maintenance menu which is used during maintenance.
The maintenance menu has a hierarchical structure through which you move to perform the various checks, setting and adjustment using the specified menu items. The contents of the respective maintenance menu items are displayed on the video monitor and time counter of the DSR-85/85P.

MENU, First layer	MENU, Second layer	MENU, Third layer
MENU DATA CONTROL (MENU CNT)	MENU STATUS DISPLAY (>MENU STA)	–
	SAVE MENU DATA (>Save MENU)	
	LOAD MENU DATA (>Load MENU)	
EDIT CHECK (EDIT Check)	VIDEO INSERT (>VIDEO INS)	–
	A1 INSERT (>A1 INS)	
	A2 INSERT (>A2 INS)	
	TC INSERT (>TC INS)	
	ASSEMBLE (>ASSEMBLE)	
SERVO CHECK (SV Check)	SENSOR CHECK (>Sensor)	CASS-COMPARTMENT (>>Cass-COM)
		TAPE TOP/END (>>Top/End)
		HUMID [MOISTURE] (>>HUMID)
		REC INHIBIT (>>REC INHI.)
	MOTOR CHECK (>Motor)	S-REEL (>>S-Reel)
		T-REEL (>>T-Reel)
		THREADING (>>Threading)
		CASS-COMPARTMENT (>>Cass-COM)
		CAPSTAN (>>Capstan)
		DRUM (>>Drum)
		REEL POSITION (>>Reel POS.)
	PLUNGER CHECK (>Plunger)	PINCH (>>Pinch)
		S-REEL BRAKE (>>S-Brake)
		T-REEL BRAKE (>>T-Brake)
		HEAD CLEANER(>>H-Cleaner)
SERVO ADJUST (SV Adjust)	S/T REEL & CAPSTAN FG (>Reel & Cap.)	–
	S-REEL ONLY (>S-Reel)	
	T-REEL ONLY (>T-Reel)	
	CAPSTAN ONLY (>Capstan FG)	
	CAPSTAN FREE SPEED (>Free speed)	AUTO (>>Auto)
		DVCAM X1 MANUAL (>>15 um x1)
		DVCAM X4 MANUAL (>>15 um x4)
		DV X1 MANUAL (>>10 um x1)
	TENSION (>Tension)	–
	RF SWITCHING POSITION (>Switching)	X1 MANUAL (>>x1 manual)
		X4 MANUAL (>>x4 manual)
	DV ATF OFFSET (>DV ATF adj)	

MENU, First layer	MENU, Second layer	MENU, Third layer
SERVO ADJUST (SV Adjust)	SAVE/LOAD CONTROL (>Save/Load)	SAVE ADJUSTING DATA (>>Save) LOAD ADJUSTING DATA (>>Load) INITIALIZE (>>Initial)
ELECTRICAL ADJUST (EL Adjust)	PLL ADJ (>PLL Adjust)	X1 F0 (>> x1 f0) X4 F0 (>>x4 f0) X1 DUTY (>>x1 duty) X4 DUTY (>>x4 duty)
	EQ ADJ (>EQ Adjust)	X1 DV (>>x1 10 um) X1 DVCAM (>>x1 15 um) X4 DVCAM (>>x4 15 um)
	RF AMP GAIN (>Amp gain)	X1 DV GAIN (>>10 um gain) X1 DVCAM GAIN (>>x1 gain) X4 DVCAM GAIN (>>x4 gain)
	REC CURRENT (>REC cur)	X1 (>>x1 REC) X4 (>>x4 REC) X4 AUTO (>>x4 AUTO)
	FE CURRENT (>FE cur)	X1 (>>x1 FE) X4 (>>x4 FE)
	FE CHECK (>FE check)	
SERVICE SUPPORT (Support)	ERROR LOG (>Error LOG) MANUAL EJECT (>Manu. Eject)	–
	DIAGNOSTICS CONTROL (>DIAG CNT)	CLEAR ERROR LOG (>>Clear LOG)
OTHERS (Others)	SOFTWARE VERSION (>Version) KEYBOARD CHECK (>KY Check)	–
	MEMORY DISPLAY (>MEM Check)	SY MEMORY DISPLAY (>>SY MEM.) SV MEMORY DISPLAY(>>SV MEM.) SP MEMORY DISPLAY (>>SP MEM.) KY MEMORY DISPLAY (>>KY MEM.) CM DISPLAY (>>CM DISP.)
	DATA DISPLAY (>Data Check)	SP DATA DISPLAY (>>SP DATA)

4-1. HOW TO OPERATE MAINTENANCE MENU

Use the following switches to execute the maintenance menu.



Use the [MENU], [↑], [↓], [←], [→], [SET] ([YES]) and [RESET] ([NO]) switches on the sub control panel.
The maintenance menu has a hierarchical structure through which you move to perform the various checks, setting and adjustment using the specified menu items.

[↑], [↓] key : Use these keys to move within the same layer.

[←], [→] key : Use these keys to move to higher or lower layers. (Ignored in the third layer)

* Indication : Video monitor : The displayed digit is shifted down.
Time counter : ">" is added to the top.
} Indicates depth of layer.

How to enter the maintenance menu

1. While pressing the [←] key, press the [MENU] key.
   The DSR-85/85P enters the maintenance menu. The maintenance menu appears on the display.
2. Select an item to modify using the [↑], [↓] keys.
   Move the cursor shown with a white background to any of the items displayed on the monitor.
3. When an item is selected, press the [→] key.
   Thus, items with a white background can be selected.

How to exit the maintenance menu

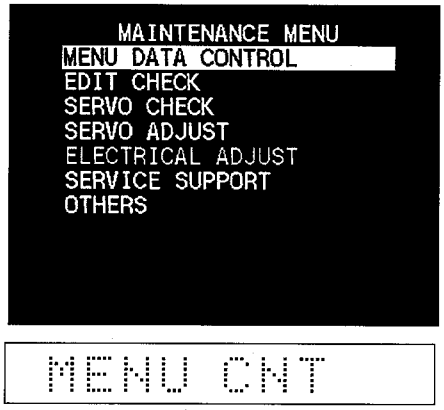
Press the [MENU] key.

4-2. MENU DATA CONTROL

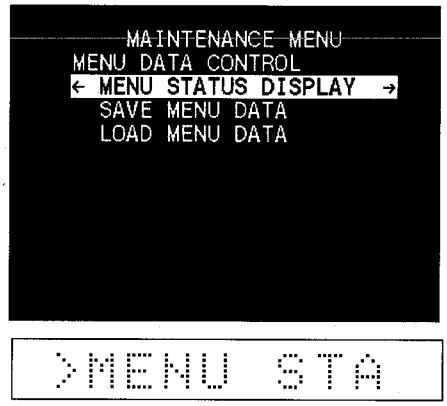
The MENU DATA CONTROL item provides a SETUP MENU data display which is used to save and load the SET UP MENU data.
This item is used to return the settings to their original values after maintenance is complete or ROM upgrading is complete.

Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to "MENU DATA CONTROL" which is displayed with a white background, using the [↑], [↓] keys.



3. Press the [→] key.
   "MENU DATA CONTROL" is selected and its lower layer submenu appears.

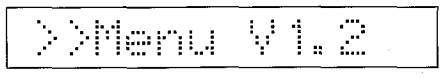


4. Move the cursor displayed with a white background to a desired item using the [↑], [↓] keys.
5. When an item is selected, press the [→] key. The contents of the selected item appear.
6. Press the [←] key to exit MENU DATA CONTROL and return to the main menu.
7. Press the [MENU] key to exit the maintenance menu.

MENU STATUS DISPLAY

Displays the current status of the SET UP MENU data.

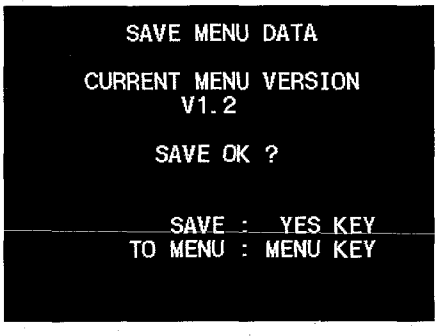
MENU VERSION : Version number of the SET UP MENU
NUMBER OF ITEM : Numbers of the SET UP MENU items
CHANGED ITEM : Numbers of the items which were changed from the factory default settings
DATA CHECK SUM : Data check sum

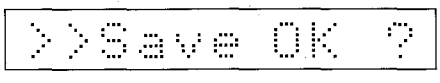


SAVE MENU DATA

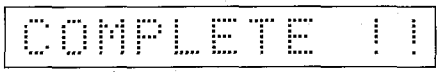
This is used to temporarily save the user's setup data of the SET UP MENU and set it at a later time.

1. The version number of the current SET UP MENU is displayed, and input is prompted by the [SET] ([YES]) key.
   * Pressing the [MENU] or [←] key returns to the main menu.





2. Press the [SET] ([YES]) key.
   The SET UP MENU data is stored in EEPROM.
   Confirm that COMPLETE appears and data save is complete.

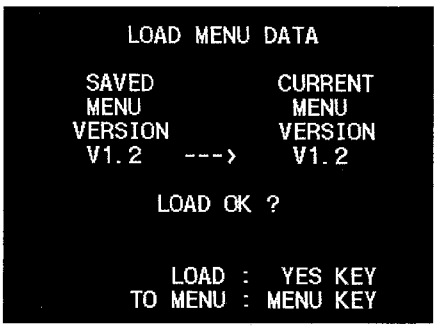


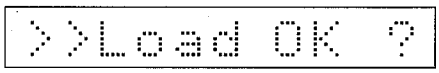
Notes :
- **Data which has once been saved will not be deleted by turning the main power on and off, or by upgrading the ROM version. However, the saved data is deleted when the MS board or the EEPROM is replaced because the data is saved in the EEPROM in the MS board.**
- **An alarm message appears when the SET UP MENU is upgraded by a version upgrade, or when the ROM is replaced. Either initialize the SET UP MENU or execute "LOAD MENU DATA" when an alarm appears.**

LOAD MENU DATA

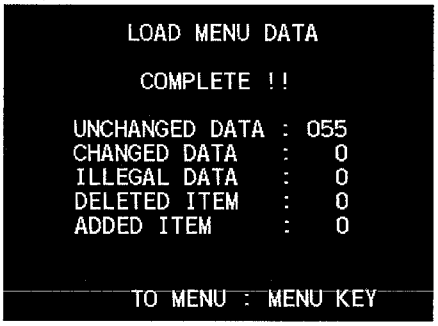
The saved data is stored as ordinary SET UP MENU data when it is loaded.

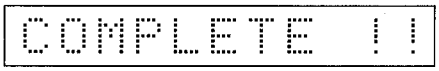
1. The version number of the current SET UP MENU and that of the SET UP MENU to load are displayed, and input is prompted by the [SET] ([YES]) key.
   * Pressing the [MENU] or [←] key returns to the main menu.





2. Press the [SET] ([YES]) key.
   The SET UP MENU data is stored in EEPROM.
   Confirm that COMPLETE appears and data save is complete.





In case of trouble :

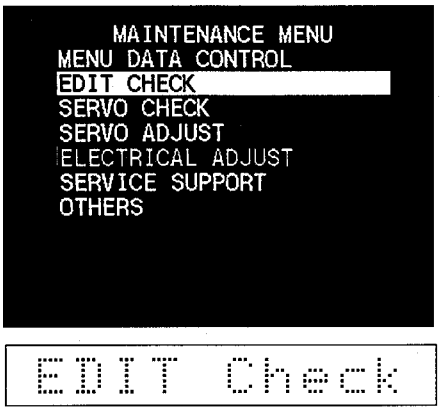
Loading of the data will not start if SET UP MENU data has not been saved or the saved SET UP MENU data contains an error.

4-3. EDIT CHECK

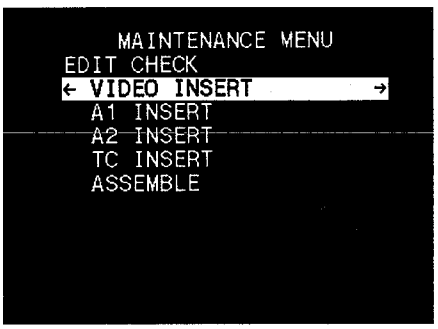
Enables the editing function to be checked without using a remote controller.

Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to "EDIT CHECK" which is displayed with a white background using the [↑], [↓] keys.



3. Press the [→] key.
   "EDIT CHECK" is selected and its lower layer submenu appears.



4. Move the cursor displayed with a white background to a desired item using the [↑], [↓] keys.
5. When an item is selected, press the [→] key. The contents of the selected item appear.
6. Press the [←] key to exit EDIT CHECK and return to the main menu.
7. Press the [MENU] key to exit the maintenance menu.

VIDEO INSERT

Pressing the REC and PLAY keys simultaneously enters the VIDEO INSERT mode.

A1 INSERT

Pressing the REC and PLAY keys simultaneously enters the AUDIO CH-1 INSERT mode.

A2 INSERT

Pressing the REC and PLAY keys simultaneously enters the AUDIO CH-2 INSERT mode.

TC INSERT

Pressing the REC and PLAY keys simultaneously enters the TIME CODE INSERT mode.

ASSEMBLE

Pressing the REC and PLAY keys simultaneously enters the ASSEMBLE mode.

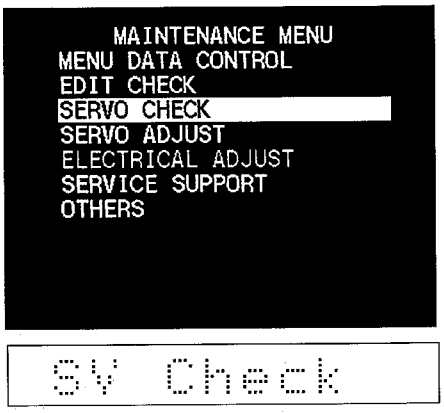
Note : When the AUDIO REC MODE is set to 4 channel, A1 and A2 are assigned to channels 1, 2, 3 and 4 in accordance with the A1 EDIT CH and A2 EDIT CH of the setup menu.

4-4. SERVO CHECK

Checks the servo system automatically or semi-automatically.

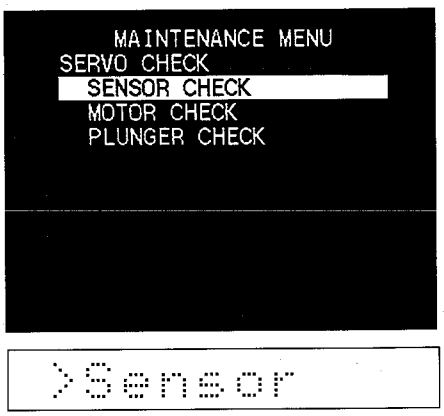
Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to "SERVO CHECK" which is displayed with a white background using the [↑], [↓] keys.

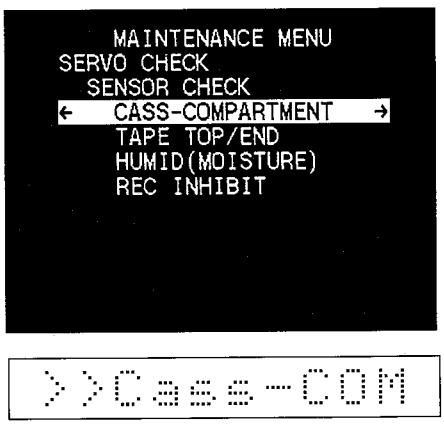


3. Press the [→] key.
   "SERVO CHECK" is selected and its lower layer submenu appears.

4. Move the cursor displayed with a white background to a desired item using the [↑], [↓] keys.
5. Press the [→] key.
   The lower layer submenu appears.



6. Move the cursor displayed with a white background to a desired item using the [↑], [↓] keys.
7. Press the [←] key to execute the selected item.
   (Refer to the respective menu description for the check procedure after execution.)
8. After completing the check, press the [MENU] key to return to the main menu.
9. To check other menus and submenus, repeat steps 4 to 8.
10. Press the [MENU] key to exit the maintenance menu.



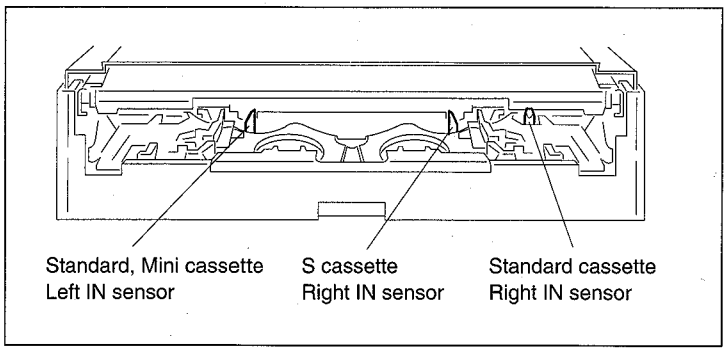
Note : If the [MENU] key is pressed while the check is in progress, the check operation is forcibly ended and the system returns to the main menu.

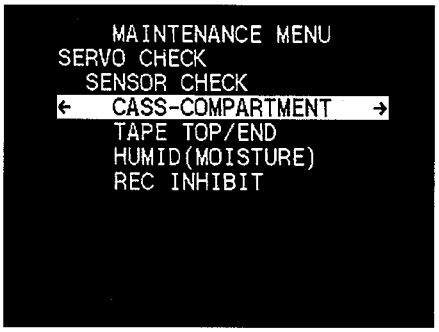
SENSOR CHECK

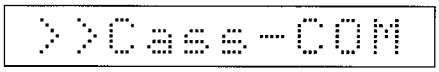
The respective items of the SENSOR CHECK are described below :

(1) CASS-COMPARTMENT

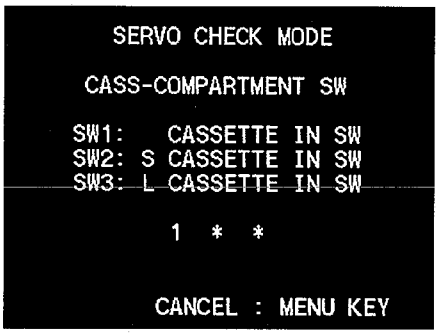
Checks the respective switches of the cassette compartment.

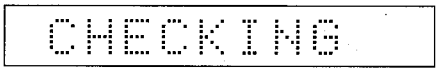




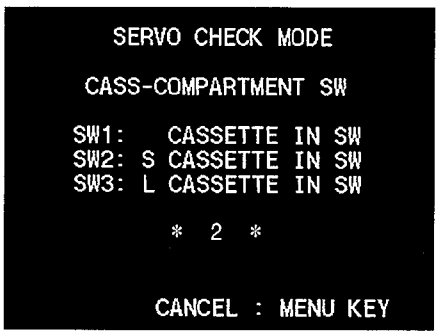


1. Press the CASSETTE IN switch with your finger or the like. Confirm that "1" appears in the area shown by the asterisk on the monitor.

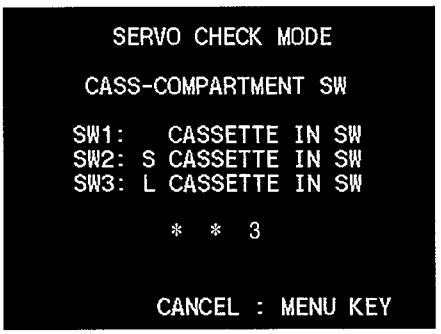




2. Press the S CASSETTE IN switch with your finger or the like. Confirm that "2" appears in the area shown by the asterisk on the monitor.

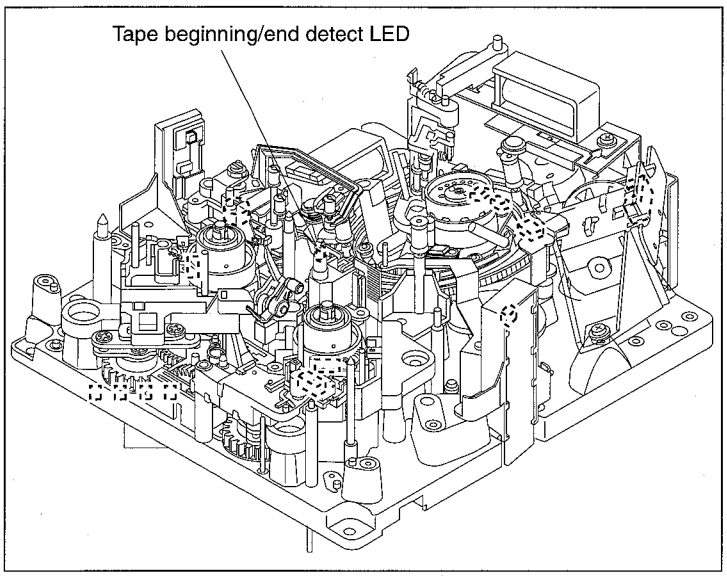


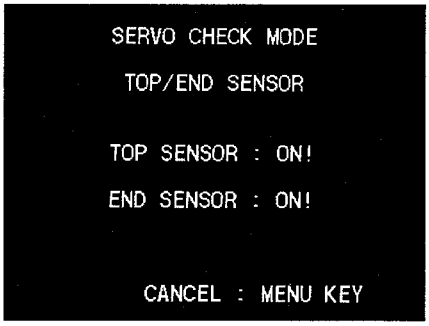
3. Press the L CASSETTE IN switch (cassette L/S size identification sensor) with your finger or the like. Confirm that "3" appears in the area shown by the asterisk on the monitor display.

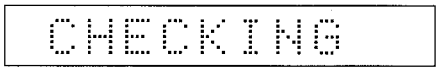


(2) TAPE TOP/END

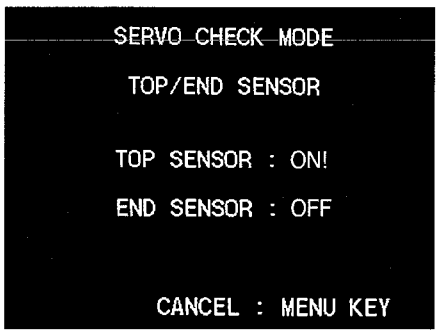
Check the tape top and tape end sensors.
Pressing the [SET] ([YES]) key moves down the cassette compartment and the display shown in the right appears.



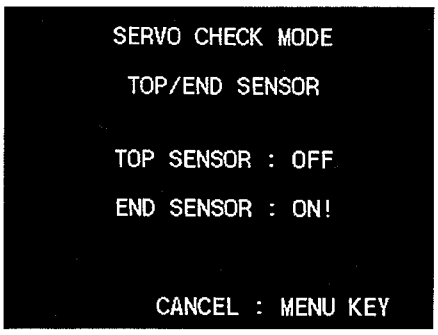




1. Interrupt the tape top sensor by inserting finger or the like in between the light emitter and receptor of the tape top sensor. Confirm that the TOP SENSOR display changes from OFF to ON on the monitor display.



2. Interrupt the tape top sensor by inserting finger or the like in between the light emitter and receptor of the tape top sensor. Confirm that the TOP SENSOR display changes from OFF to ON on the monitor display.

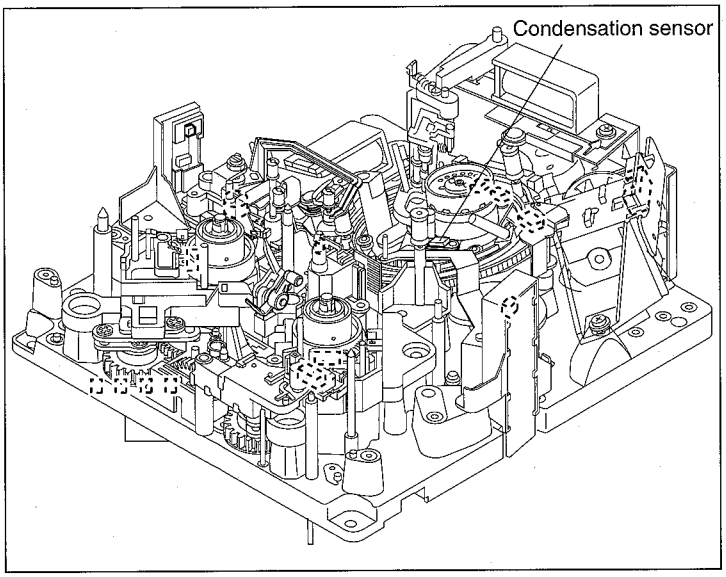


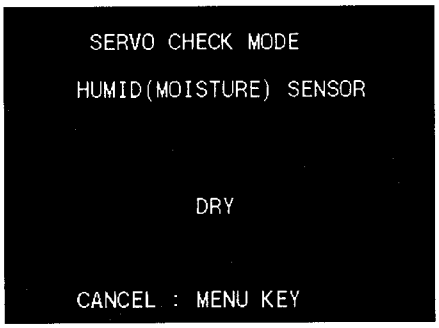
In case of trouble :

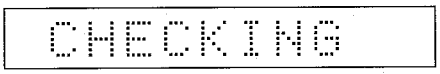
If the display does not change from OFF to ON, check whether the tape top sensor or the tape end sensor itself is defective.
Check also the tape top/tape end sensor circuit (PTC-85/86/87 board).

(3) HUMID (MOISTURE)

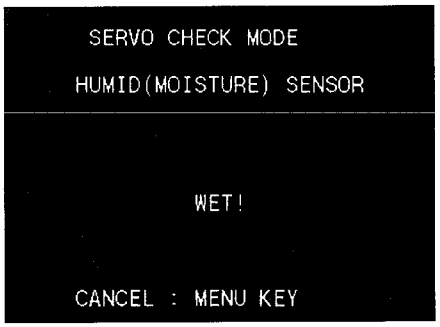
Checks the HUMID (condensation) sensor.







1. Bring a cotton swab moistened with water in contact with the HUMID sensor.
   Confirm that DRY changes to WET! on the monitor display.



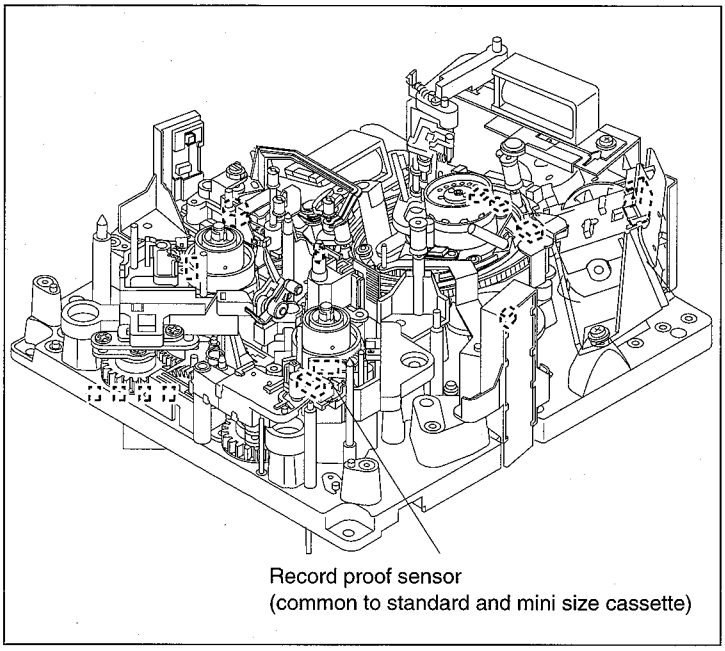
2. Remove water from the HUMID sensor by wiping it with a dry cotton swab, or blow wind onto the HUMID sensor to evaporate any water.
   Confirm that the display changes to DRY on the monitor.

In case of trouble :

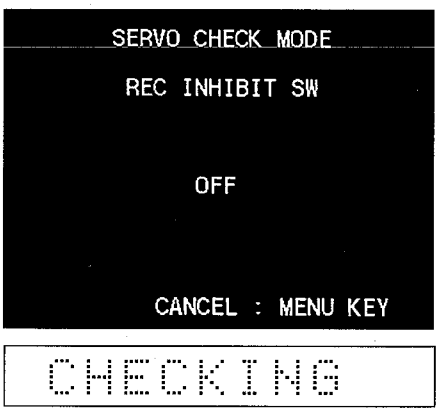
If the display does not change from DRY to WET!, check whether the HUMID sensor itself is defective.
Check also the HUMID sensor amplifier (SY-220 board).

(4) REC INHIBIT

Checks the REC INHIBIT switch.



1. Press the METAL REC INHIBIT switch.
   Confirm that OFF is displayed on the monitor display.

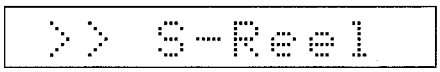


In case of trouble :

If OFF is not displayed on the specified position, check the sensor on the MIC arm board.

MOTOR CHECK

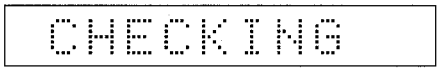
The respective items of "MOTOR CHECK" are described below:



(1) S-REEL

Checks the S-reel motor.

Select the S REEL MOTOR from the submenu and press the [SET] ([YES]) key. Press the [↑] then [↓] keys (note: keep pressing for one to two seconds) and turn the S reel motor in the FWD then REV directions. Confirm that the S reel motor rotates in the specified direction while pressing the [↑] or [↓] key after releasing the reel brake by activating the brake solenoid.



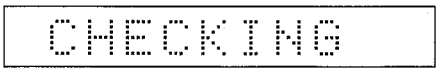
In case of trouble :

If the brake solenoid cannot be heard to operate or the S reel motor does not rotate in the specified direction even though the key is pressed, check the S reel motor and the reel motor driver circuit (RM-159 board, SV-161 board).

(2) T-REEL

Checks the T-reel motor.

Select the T REEL MOTOR from the submenu and press the [SET] ([YES]) key. Press the [↑] then [↓] keys (note: keep pressing for one to two seconds) and turn the T reel motor in the FWD then REV directions. Confirm that the T reel motor rotates in the specified direction while pressing the [↑] or [↓] key after releasing the reel brake by activating the brake solenoid.

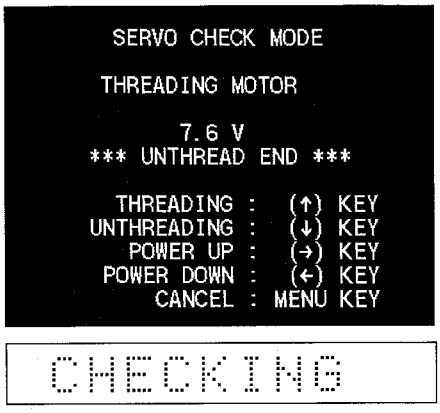


In case of trouble :

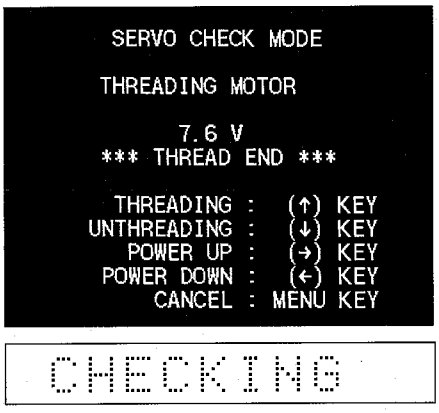
If the operating sound of the brake solenoid cannot be heard or the T reel motor does not rotate in the specified direction even though the key is pressed, check the T reel motor and the reel motor driver circuit (RM-160 board, SV-161 board).

(3) THREADING

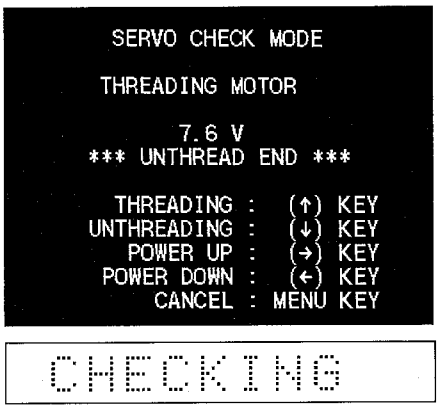
Checks the threading motor, the thread-end sensor and the unthread-end sensor.



1. Select the THREADING MOTOR from the submenu and press the [SET] ([YES]) key. Keep pressing the [↑] key to rotate the threading motor in the FWD direction.
   Confirm that the threading ring completes threading and THREAD END appears on the monitor display.

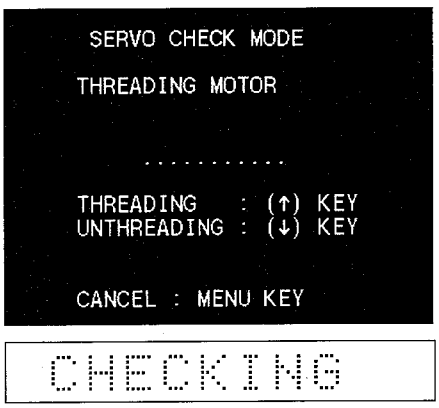


2. Keep pressing the [↓] key to rotate the threading motor in the REV direction.
   Confirm that the threading ring completes unthreading and UNTHREAD END appears on the monitor display.



In case of trouble :

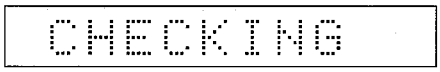
If the threading motor does not rotate, or if dots [.....] keep appearing on the video monitor, or if "UNTHREAD END" does not appear even though unthreading is complete, check whether the threading motor (on the PTC-88 board), the driver circuit (SV-161 board) and the sensors on the PTC-84 board are defective. Check also the threading FG amplifier circuit (SY-220 board) and the sensor (on the PTC-88 board).



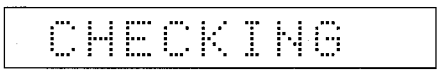
(4) CASS-COMPARTMENT

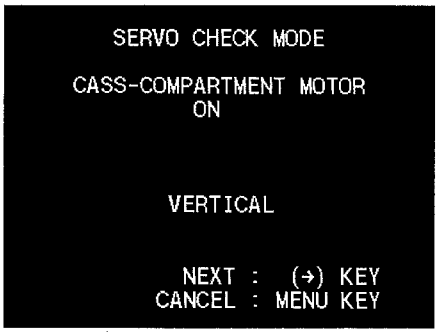
Check the cassette compartment motor.

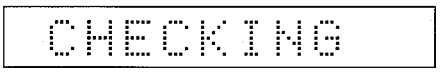
Select CASS-COMPARTMENT and press the [SET] ([YES]) key.

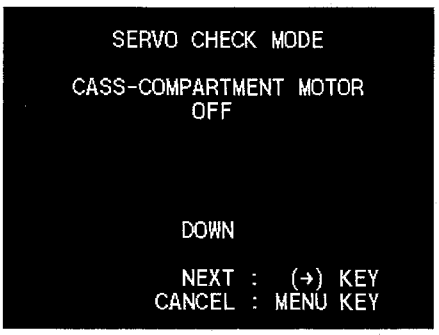


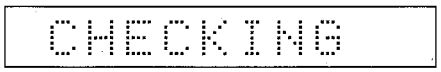
Press the [→] key.
Confirm that the cassette compartment moves down.
Confirm that pressing the [→] key again moves up the cassette compartment.
(The monitor display changes in order of reversing the steps of moving down the cassette compartment.)







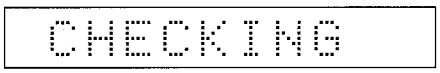




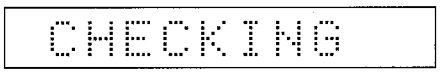
In case of trouble :
If the monitor display does not change, check the cassette compartment motor and the sensor input circuit (SY-220 board).

(5) CAPSTAN

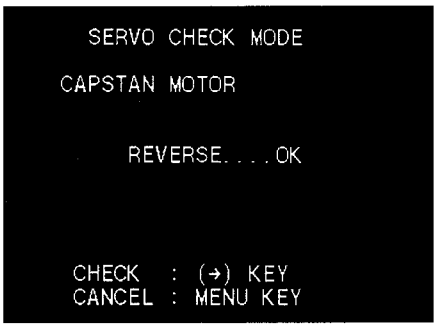
Checks the capstan motor.
Select CAPSTAN MOTOR and press the [SET] ([YES]) key.

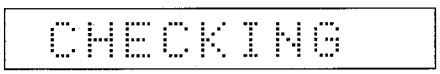


1. Press the [→] key.
   Confirm that [FORWARD ... OK] appears on the monitor display.



2. Press the [→] key again.
   Confirm that [REVERSE ... OK] appears on the monitor display.

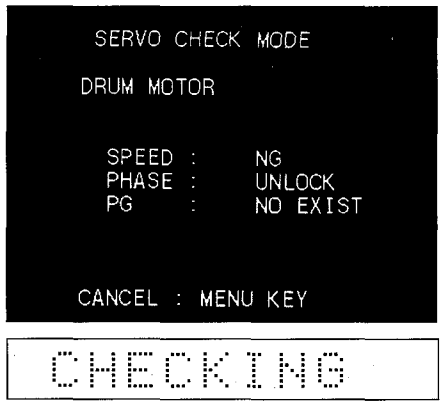




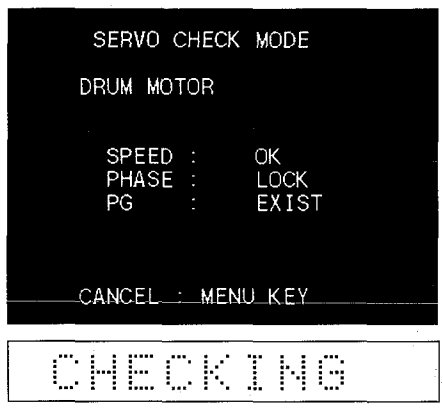
In case of trouble :
If the monitor display does not change, check the capstan motor and the capstan motor driver circuit (MS-43/SV-161 board)

(6) DRUM

Checks the drum motor.



When the [YES] key is pressed, confirm the following:
SPEED : The monitor display changes to [OK].
PHASE : The monitor display changes to [LOCK].
PG : The monitor display changes to [EXIST].

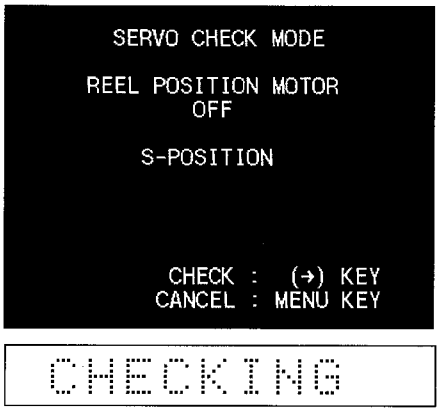


In case of trouble :

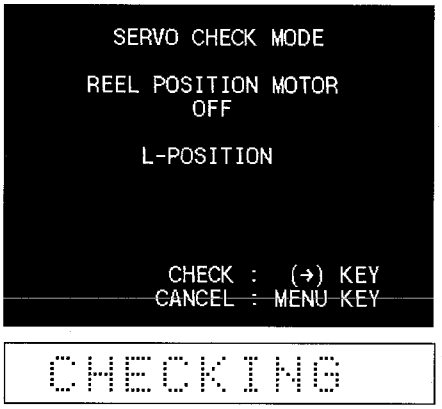
If the monitor display does not change, check the drum motor, the drum motor driver circuit, the drum FG amp. circuit and the drum PG amp. circuit. (MS-43 board)

(7) REEL POSITION

Check the reel position motor and the reel L/S position sensor.



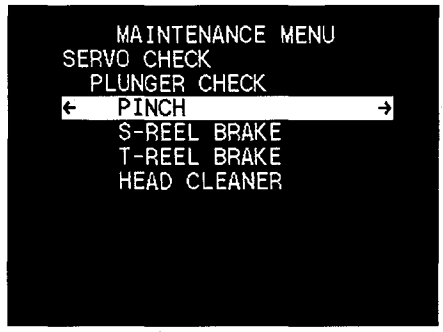
Press the [YES] key, then press the [→] key.
Confirm that the reel table moves from the S-position to the L-position and the monitor display changes.

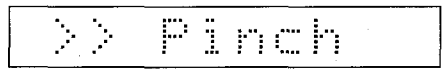


In case of trouble :
If the reel table does not move or the monitor display does not change, check the reel position motor, the reel L/S position sensor (MS-43 board) and reel position motor driver circuit (SV-161 board).

PLUNGER CHECK

The respective items of "PLUNGER CHECK" are described below.

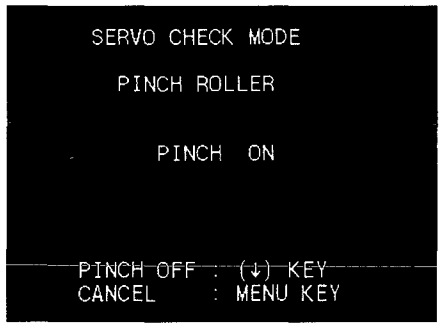


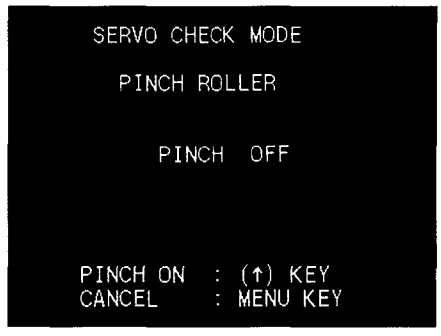


(1) PINCH

Checks the pinch roller solenoid.

Pressing the [SET] ([YES]) key starts threading and activates the pinch solenoid.
Pressing the [MENU] key releases the pinch solenoid and starts unthreading. The monitor display returns to the main menu.



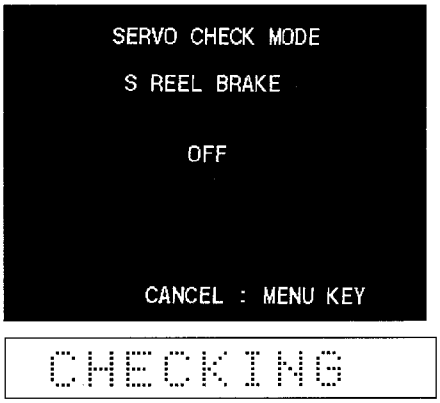


(2) S-REEL BRAKE

Checks the S-reel brake solenoid.

1. Pressing the [SET] ([YES]) key activates the S-reel brake solenoid.
2. Pressing the [MENU] key releases the S-reel brake solenoid. The monitor display returns to the main menu.

In case of trouble :
If the S-brake solenoid cannot be heard to operate, check the S reel brake solenoid and its driver circuit (SV-161 board, RM-159 board).

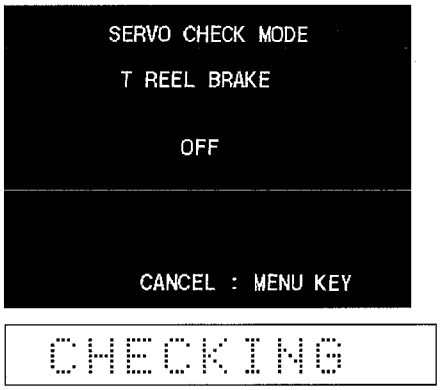


(3) T-REEL BRAKE

Checks the T-reel brake solenoid.

1. Pressing the [SET] ([YES]) key activates the T-reel brake solenoid.
2. Pressing the [MENU] key releases the T-reel brake solenoid. The monitor display returns to the main menu.

In case of trouble :
If the T-brake solenoid cannot be heard to operate or the monitor display does not change, check the T reel brake solenoid and its driver circuit (SV-161 board, RM-160 board).

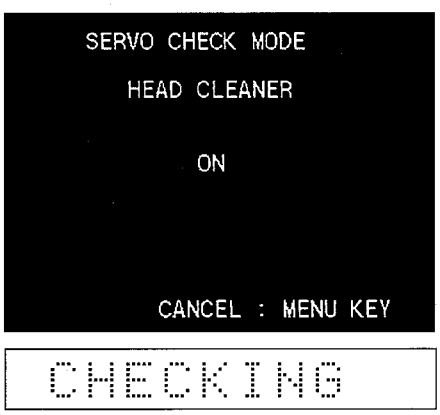


(4) HEAD CLEANER

Checks the head cleaner solenoid.

1. Pressing the [SET] ([YES]) key activates the head cleaner.
2. Pressing the [MENU] key releases the head cleaner. The monitor display returns to the main menu.

In case trouble :
If the head cleaner solenoid cannot be heard to operate, check the head cleaner solenoid and its driver circuit (SV-161 board).

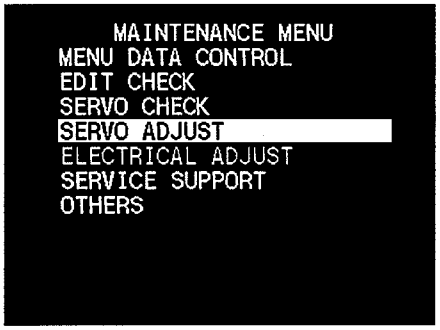


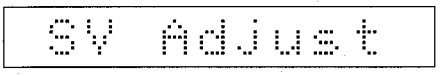
4-5. SERVO ADJUST

Checks the servo system automatically or semi-automatically.

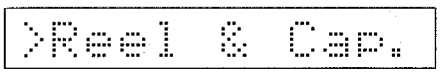
Operating procedure

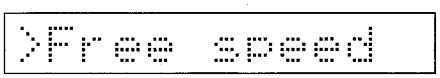
1. Enter the maintenance menu.
2. Move the cursor to "SERVO ADJUST " which is displayed with a white background using the [↑], [↓] keys.



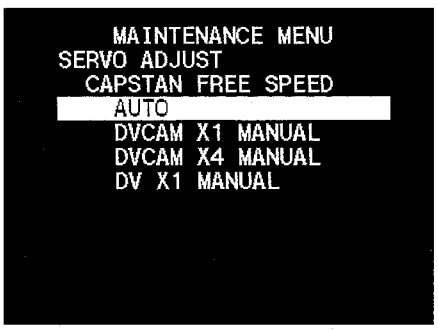


3. Press the [→] key.
   "SERVO ADJUST " is selected and its lower layer submenu appears.





4. Move the cursor displayed with a white background to a desired item using the [↑], [↓] keys.
5. Press the [→] key.
   The lower layer submenu appears.



6. Move the cursor displayed with a white background to a desired item using the [↑], [↓] keys.
7. Press the [→] key to execute the selected item. (Refer to the respective menu description for the adjustment procedure after execution.)
8. After completing the adjustment, press the [←] key to return to the main menu.
9. To check other menus and submenus, repeat steps 4 to 8.
10. After completing all checks, execute "SAVE/LOAD CONTROL" to save all adjustment data into EEPROM.

Note : Execute "SAVE/LOAD CONTROL" after completing an adjustment to save the adjustment data into EEPROM. You can also save all adjustment data at once after completing the multiple adjustments.
Execute "SAVE/LOAD CONTROL" after completing all adjustments.
Do not turn off the main power while the saving is in progress.
If the main power is turned off while the saving is in progress, all of the adjustment data will be lost.

11. Press the [MENU] key to exit the maintenance menu.

Note : If the [MENU] key is pressed while the check is in progress, the check operation is forcibly ended and the system returns to the main menu.

S/T REEL & CAPSTAN FG

Executes the automatic adjustment of the S and T reels and, capstan systems.
After completing adjustment, confirm that "COMPLETE" appears.

Adjustment items

s reel fg check
s reel offset/friction
s reel torque
t reel fg check
t reel offset /friction
t reel torque
capstan fg duty

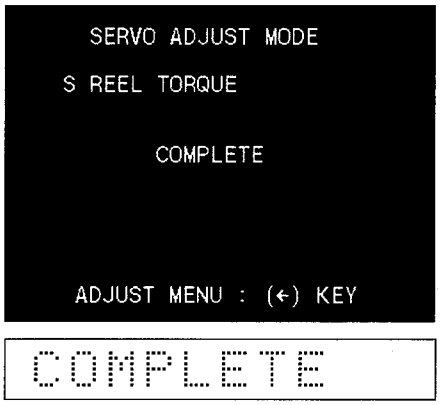
After COMPLETE appears, execute SAVE ADJUSTING DATA from the menu display SAVE/LOAD CONTROL to save the adjustment data to EEPROM.

In the case of trouble :

When "ADJUST INCOMPLETE" and a trouble indication appear on monitor display, check the reel FG amplifier circuit, reel motor driver circuit, capstan motor and capstan motor driver circuit. (MS-43, SV-161 board)

S-REEL ONLY

Executes the automatic adjustment of the S reel only.
After completing adjustment, confirm that "COMPLETE" appears.



Adjustment items

s reel fg check
s reel offset/friction
s reel torque

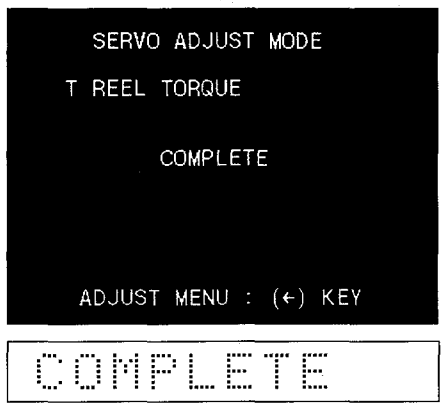
After COMPLETE appears, execute SAVE ADJUSTING DATA from the menu display SAVE/LOAD CONTROL to save the adjustment data to EEPROM.

In the case of trouble :

When "ADJUST INCOMPLETE" and a trouble indication appear on monitor display, check the reel FG amplifier circuit and reel motor driver circuit. (SV-161 board)

T-REEL ONLY

Executes the automatic adjustment of the T reel only. After completing adjustment, confirm that "COMPLETE" appears.



Adjustment items

t reel fg check
t reel offset/friction
t reel torque

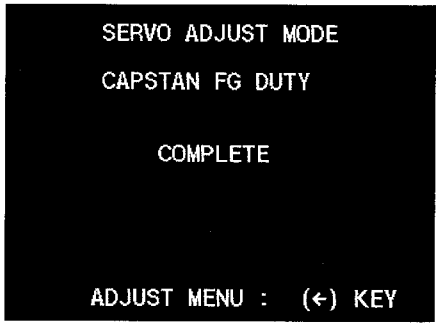
After COMPLETE appears, execute SAVE ADJUSTING DATA from the menu display SAVE/LOAD CONTROL to save the adjustment data to EEPROM.

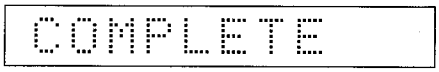
In the case of trouble :

When "ADJUST INCOMPLETE" and a trouble indication appear on monitor display, check the reel FG amplifier circuit and reel motor driver circuit. (SV-161 board)

CAPSTAN FG ONLY

Executes the automatic adjustment of the capstan FG only.
After completing adjustment, confirm that "COMPLETE" appears.





Adjustment items
capstan fg duty

After COMPLETE appears, execute SAVE ADJUSTING DATA from the menu display SAVE/LOAD CONTROL to save the adjustment data to EEPROM.

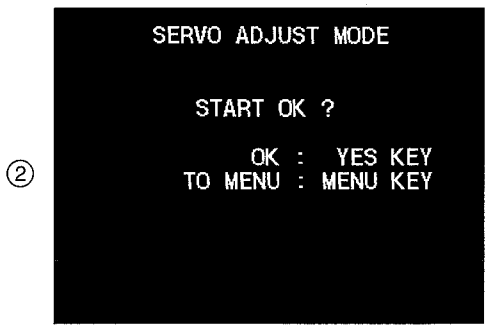
In the case of trouble :
When "ADJUST INCOMPLETE" and a trouble indication appear on monitor display, check the capstan FG amplifier circuit (SV-161, MS-43 board) and capstan motor driver circuit.

CAPSTAN FREE SPEED

1. Select the desired item using [↑], [↓] key.

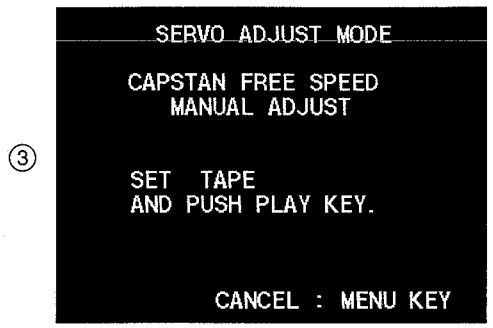
①

2. Select the display ② using the [→] key and press the [SET] ([YES]) key.



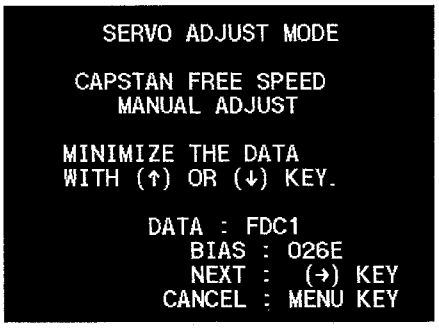
②

3. Playback the tape.



③

4. Make adjustment until the "DATA" value becomes minimum using the [↑], [↓] key.



5. Press the [→] key.

TENSION

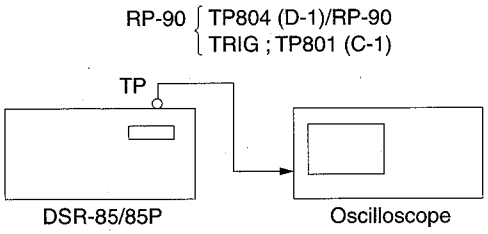
Refer to section 6-23-1 for "TENSION" adjustment.

RF SWITCHING POSITION

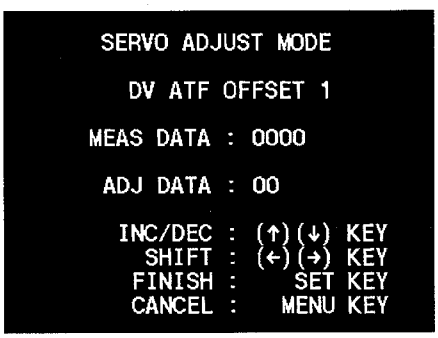
Refer to section 7-6 for "RF SWITCHING POSITION" adjustment.

DV ATF OFFSET

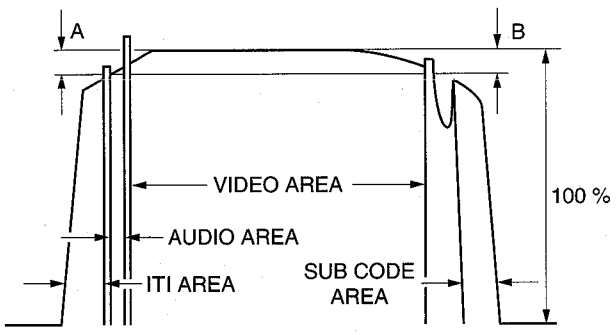
[Connection diagram]



1. First, turn on S-803-1 to -8 of the RP-90.
2. S801(D-1)/RP-90; 6 (Rotary switch)
3. Select "DV ATF OFFSET (1)".
4. Insert the alignment tape XH4-1A/XH4-1AP, and enter the playback mode. 30 seconds later, press the [→] key.
5. Set the waveform of TP to the set value using the [↑], [↓] keys.

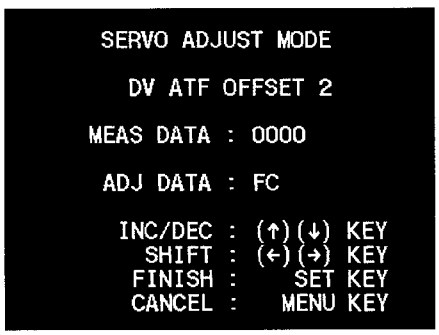


A: End of audio area
B: End of video area



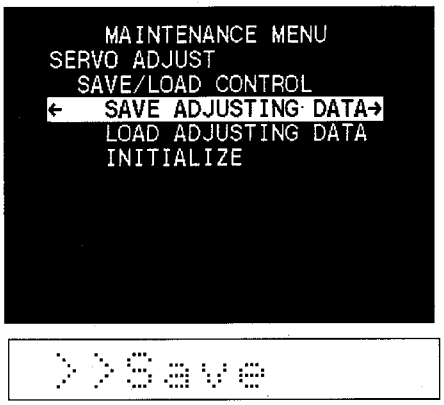
Spec. A, B ≦ 30 %
(The DATA (hexadecimal, 4 digits) is the minimum point even though A and B are unbalanced.)

6. Switch S801 in the order of 7 → 8 → 9 → 6 to confirm the specification.
7. Select the "DV ATF OFFSET (2)".
8. Perform steps 2 to 6 again.
9. Press the [SET] ([YES]) key to save data.
10. Eject the XH4-1A/XH4-1AP.
11. Turn off S803-1 to -8.



SAVE/LOAD CONTROL

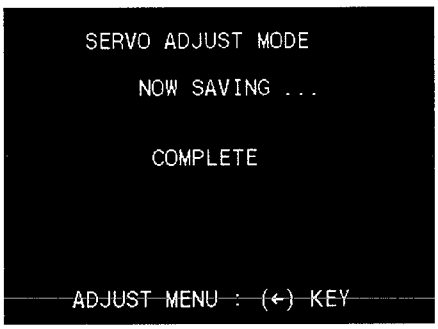
The respective items of "SAVE/LOAD CONTROL" are described below.



(1) SAVE ADJUSTING DATA

Saves the adjustment data to EEPROM.
Confirm that "COMPLETE" appears after completing saving data.

Note : Be sure to save data using this mode after completing adjustment.

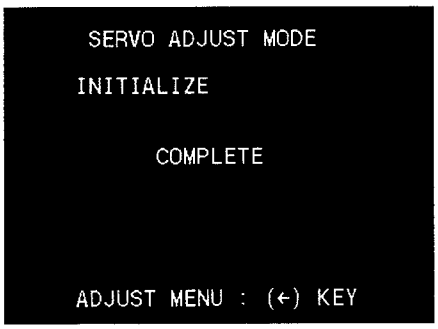


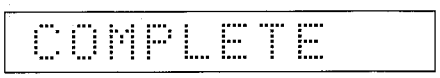
(2) LOAD ADJUSTING DATA

Loads the adjustment data to EEPROM.
Confirm that "COMPLETE" appears after completing loading data.

(3) INITIALIZE

Use INITIALIZE only when the MS-43 board or the microprocessor on either MS-43 board is replaced.
Loads the initial data of the adjustment data from ROM.
Confirm that "COMPLETE" appears after completing initialization.

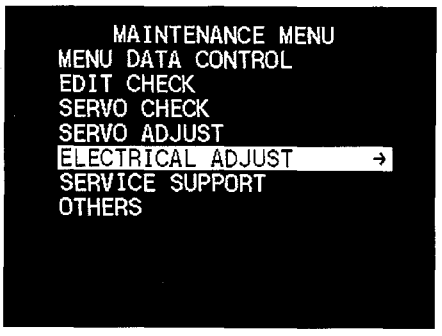




4-6. ELECTRICAL ADJUSTMENT

Operating procedure

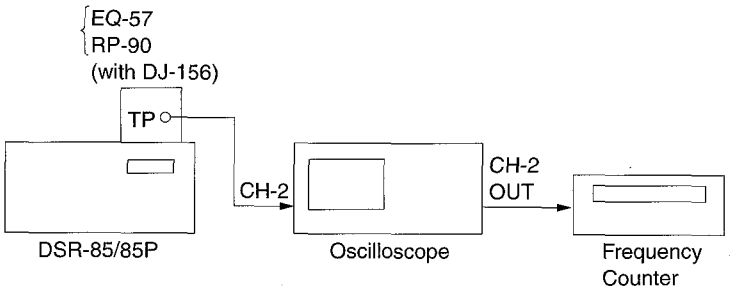
1. Enter the maintenance menu.
2. Move the cursor to "ELECTRICAL ADJUST" which is displayed with a white background using the [↑], [↓] keys.
3. Press the [→] key.
   "ELECTRICAL ADJUST" is selected and its lower layer submenu appears.

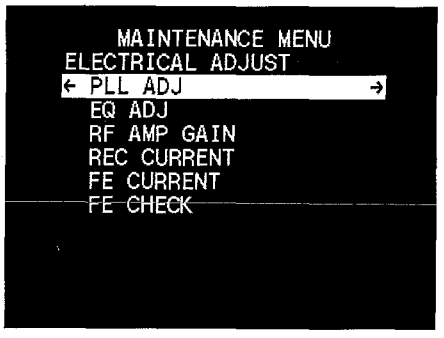


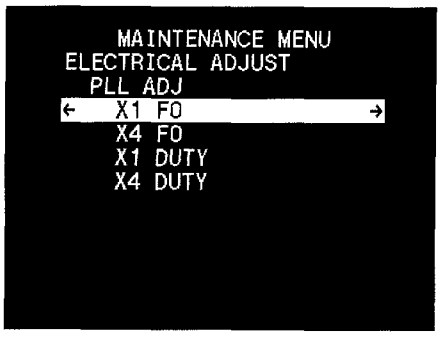
4-6-1. PLL ADJ

1. Select "PLL ADJ" with the [↑], [↓] keys.

[F0 adjustment • connection diagram]

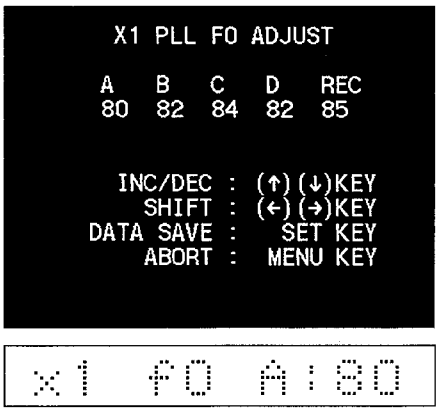






[X1 F0] Adjustment

1. Enter the adjustment submenu display by pressing the [→] key, and by again pressing the [→] key from "X1 F0".
2. Insert the alignment tape XH5-1A2/XH5-1AP2 and enter the playback mode.
3. Select the respective heads of A, B, C, D, and REC one after another using the [←], [→] keys, and adjust frequency of each TP (Test Point) using the [↑], [↓] keys until specifications are satisfied.
4. When adjustments of all heads are complete, press the [SET] ([YES]) key to save the adjustment data.
5. Eject the alignment tape XH5-1A2/XH5-1AP2.

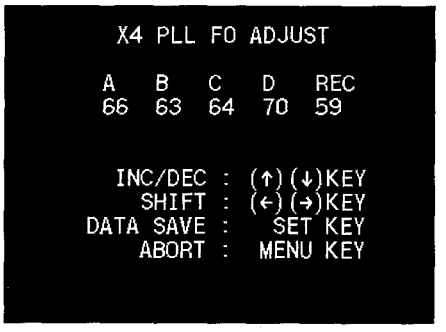


HEAD	Measurement point
A	TP204 (H-1)/EQ-57
	E203 (H-2)
B	TP404 (F-1)/EQ-57
	E403 (E-2)
C	TP604 (D-1)/EQ-57
	E603 (D-2)
D	TP804 (B-1)/EQ-57
	E803 (B-2)
REC	TP304 (G-1)/RP-90
	E302 (F-1)

Spec. 20.8 ±0.1 MHz

[X4 F0] Adjustment

1. Enter the adjustment submenu display by pressing the [→] key, and by again pressing the [→] key from "X4 F0".
2. Insert the alignment tape XH5-1A2/XH5-1AP2 and enter the playback mode.
3. Select the respective heads of A, B, C, D, and REC one after another using the [←], [→] keys, and adjust frequency of each TP (Test Point) using the [↑], [↓] keys until specifications are satisfied.
4. When adjustments of all heads are complete, press the [SET] ([YES]) key to save the adjustment data.
5. Eject the alignment tape XH5-1A2/XH5-1AP2.

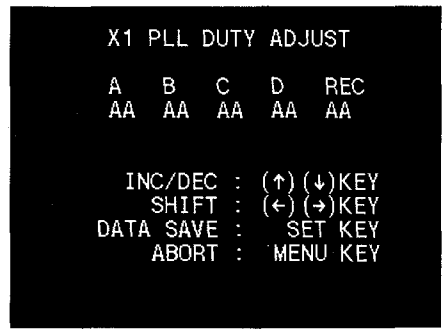


HEAD	Measurement point
A	TP204 (H-1)/EQ-57
	E203 (H-2)
B	TP404 (F-1)/EQ-57
	E403 (E-2)
C	TP604 (D-1)/EQ-57
	E603 (D-2)
D	TP804 (B-1)/EQ-57
	E803 (B-2)
REC	TP304 (G-1)/RP-90
	E302 (F-1)

Spec. 83.5 ±0.5 MHz

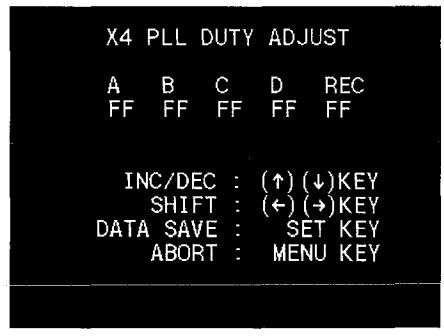
[X1 DUTY] Adjustment

1. Enter the adjustment submenu display by pressing the [→] key from "X1 DUTY".
2. Select the respective heads of A, B, C, D, and REC one after another using the [←], [→] keys, and adjust all heads to "AA" using the [↑], [↓] keys.
3. When adjustments of all heads are complete, press the [SET] ([YES]) key to save the adjustment data.



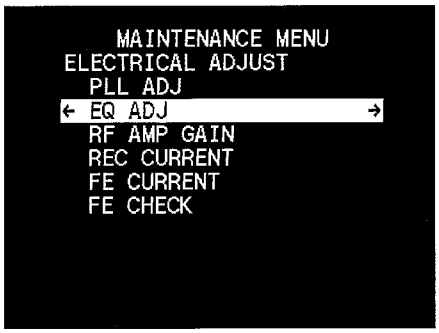
[X4 DUTY] Adjustment

1. Enter the adjustment submenu display by pressing the [→] key from "X4 DUTY".
2. Select the respective heads of A, B, C, D, and REC one after another using the [←], [→] keys, and adjust all heads to "FF" using the [↑], [↓] keys.
3. When adjustments of all heads are complete, press the [SET] ([YES]) key to save the adjustment data.



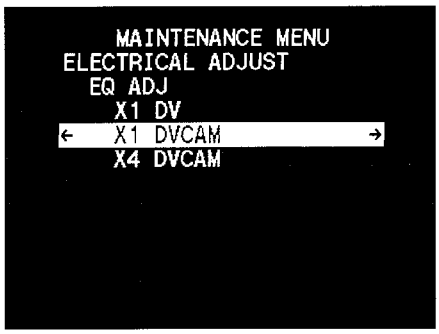
4-6-2. EQ ADJ

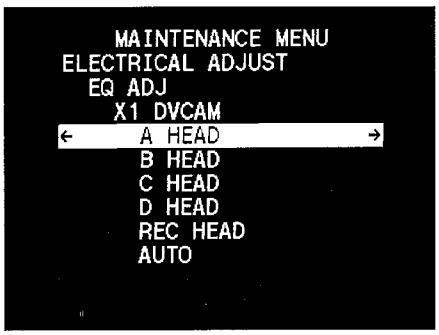
1. Select "EQ ADJ" using the [↑], [↓] keys.



[DV, X1 DVCAM PHASE]

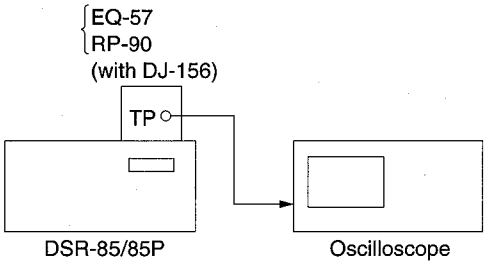
1. After pressing the [↓], [→] keys, press the [→] key from "X1 DVCAM", and press the [→] key from "A HEAD" to enter the adjustment display.





2. Select "COS" using the [←], [→] keys, and set the value to "FF" using the [↑], [↓] keys. Then, press the [SET] ([YES]) key.
3. Set each head of B, C, D, and "X1 DV" in the same way.

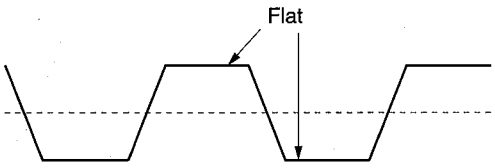
[Connection diagram]



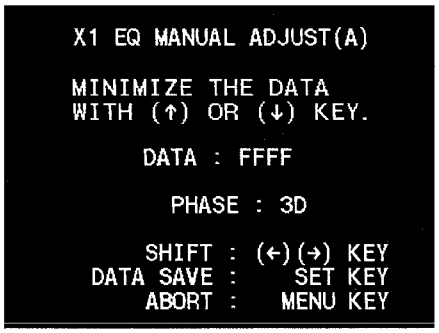
4. Turn on the S802-1/RP-90. (Set to the upper side.)
   * ITI center mode

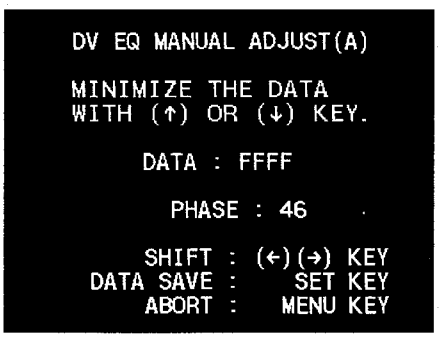
5. Insert the XH5-1A2/XH5-1AP2, and enter the playback mode.
6. Select PHASE of each head of "X1 DVCAM". Adjust the set value of each TP using the [↑], [↓] keys, and press the [SET] ([YES]) key.
7. Insert the XH4-1A/XH4-1AP, and enter the playback mode.
8. Select PHASE of each head of "X1 DV". Adjust the set value of each TP using the [↑], [↓] keys, and press the [SET] ([YES]) key.
9. Turn off the S802-1/RP-90. (Set to the lower side.)

HEAD	Adjustment point
A	TP103 (G-4)/EQ-57, E301 (E-4)
B	TP303 (E-4)/EQ-57, E301 (E-4)
C	TP503 (C-4)/EQ-57, E701 (A-4)
D	TP703 (A-4)/EQ-57, E701 (A-4)



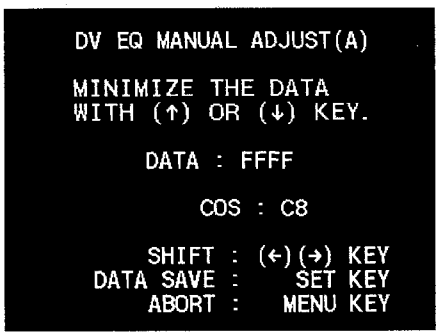
Spec. Symmetric with respect to up-and-down and flat



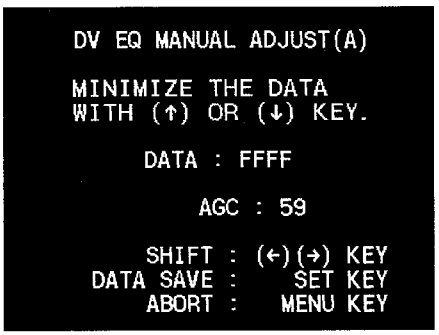


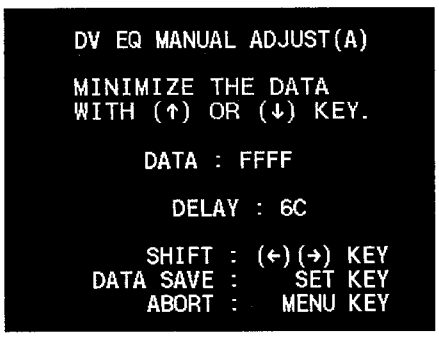
X1 DV EQ

1. Insert the XH4-1A/XH4-1AP, and enter the playback mode.
2. Select "X1 DV, A HEAD, COS", and set the value of DATA (hexadecimal, 4 digits) to be the minimum (000X: The first digit is changed) using the [↑], [↓] keys.



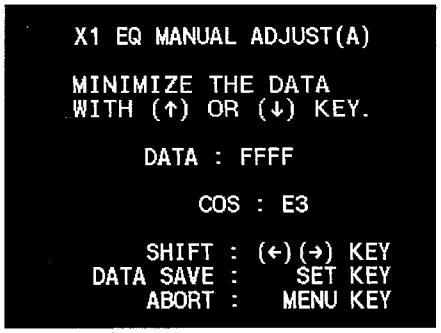
3. Select "AGC" and "DELAY" so that the value of DATA is the minimum.
4. Press the [RESET] ([NO]) key for each of items "COS, AGC, DELAY". Confirm that the DATA is 000X when "*" appears on the right of the 4-digit value, and press the [SET] ([YES]) key. If the DATA is invalid, press the [RESET] ([NO]) key, and repeat steps 2 and 3 until "*" disappears.
5. Repeat steps 2, 3, and 4 for each of heads B, C, and D. Then, set the value of DATA to be the minimum (000X).



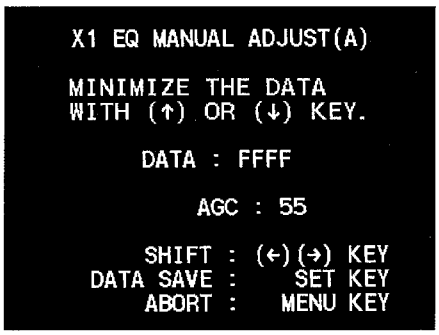


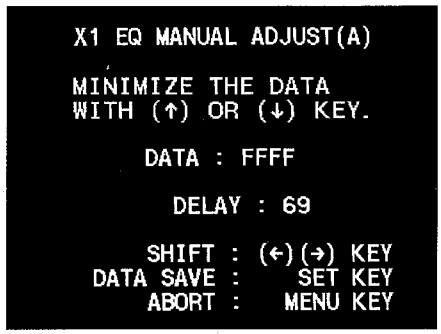
X1 DVCAM EQ

1. Insert the XH5-1A2/XH5-1AP2, and enter the playback mode.
2. Select "X1 DVCAM, A HEAD, COS", and display the DATA (hexadecimal, 4 digits) in the minimum (000X: The first digit is changed) using the [↑], [↓] keys.



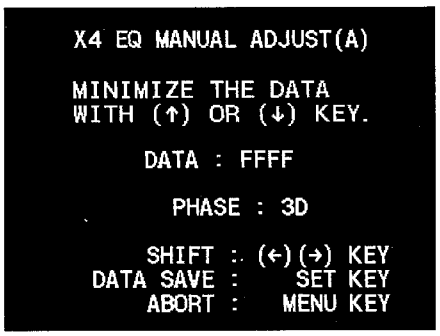
3. Select "AGC" and "DELAY" so that the value of DATA is the minimum.
4. Press the [RESET] ([NO]) key for each of items "COS, AGC, DELAY". Confirm that the DATA is 000X when "*" appears on the right of the 4-digit value, and press the [SET] ([YES]) key. If the DATA is invalid, press the [RESET] ([NO]) key, and repeat steps 2 and 3 until "*" disappears.
5. Repeat steps 2, 3, and 4 for each of heads B, C, and D. Then, set the value of DATA to be the minimum (000X).

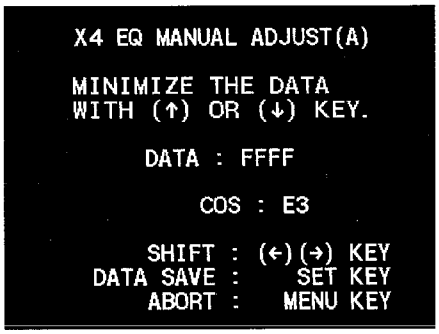


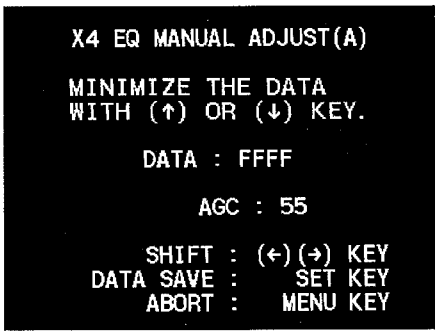


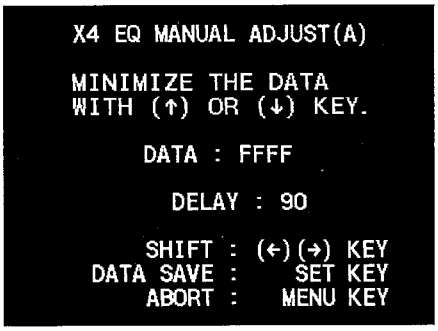
X4 DVCAM EQ

1. Insert the XH5-1A2/XH5-1AP2, and enter the playback mode.
2. Select "X4 DVCAM, A HEAD", and set the value of DATA to be the minimum using the [↑], [↓] keys in the order of "PHASE (fine control) → COS → AGC → DELAY".
3. Press the [RESET] ([NO]) key for each of items "PHASE, COS, AGC, DELAY". Confirm that the DATA is 000X when "*" appears on the right of the 4-digit value, and press the [SET] ([YES]) key. If the DATA is invalid, press the [RESET] ([NO]) key, and repeat step 2 until "*" disappears.
4. Repeat steps 2 and 3 for each of heads B, C, and D. Then, set the value of DATA to be the minimum (000X).





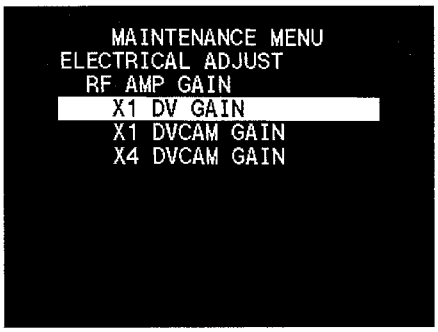




4-6-3. RF AMP GAIN ADJ

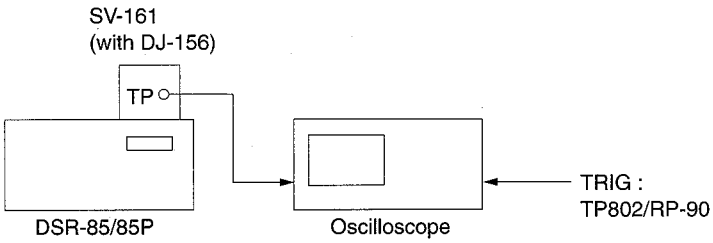
RF AMP GAIN

1. Move the cursor to "RF AMP GAIN" which is displayed with a white background using the [↑], [↓] keys.
2. Press the [→] key and select "RF AMP GAIN".



[X1 DV GAIN] Adjustment

[Connection diagram]



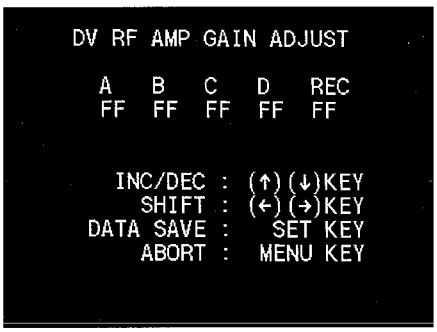
1. Enter the adjustment display by pressing the [→] key from "X1 DV GAIN".
2. Insert the alignment tape XH4-1A/XH4-1AP and enter the playback mode.

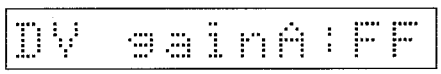
HEAD	Adjustment point
A	CN118-6 pin/SV-161 (DJ-156)
C	CN118-10 pin/SV-161 (DJ-156)

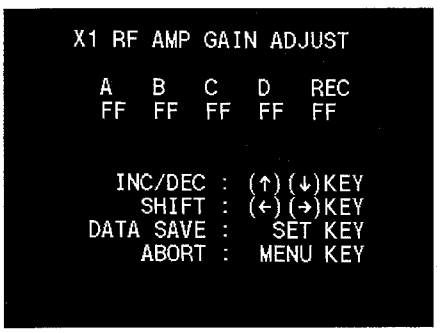
Spec. 300 ±10 mVp-p (RF Peak Level)

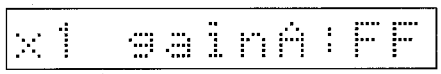
3. Adjust the A head amplitude and C head amplitude only by the [↑], [↓] keys.
   * Amplitude of the B, D, and REC HEAD are fixed by the fixed value of "FF".

4. After adjustment is complete, press the [SET] ([YES]) key to save the data.



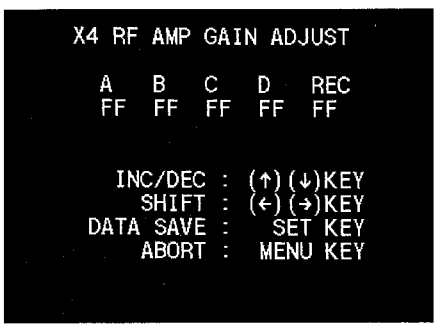






[X1 DVCAM, X4 DVCAM GAIN]

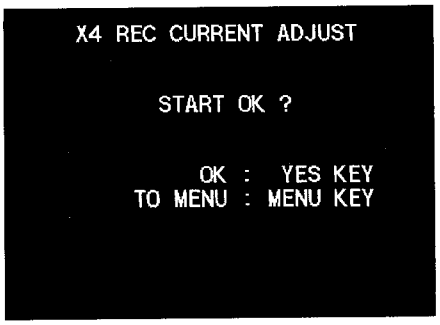
* These adjustments are fixed to "FF".



4-6-4. REC CURRENT ADJ

Select "REC CURRENT" using the [↑], [↓] keys.

1. Insert a blank tape.
2. Select "X4 AUTO" using the [→] key, and enter the adjustment mode.
3. After "START OK? "appears, press the [SET] ([YES]) key. As the adjustment is done semi-automatically, record "REC CURRENT" to the tape decleasing from 10 h to 60 h. After the recording, the recorded part is replayed automatically, and the data of 4 hexadecimal digits corresponding to replay error rate is displayed.



4. Set the optimum values of REC CURRENT of each head using the [←], [↑], [↓], and [→] keys, and press the [SET] ([YES]) key.

• Example of selecting the optimum value

The 4-digit value that corresponds to the playback error rate is displayed as shown. The value marked ← that is close to the minimum 4-digit data is the optimum value, however, be sure to select the current value as described below.

(1) +8 h of ← the command value (minimum) in the table ••• See Cch in the table.
60 h in case of 60 h ••• See Ach in the table.

(2) When the display data of 4 hexadecimal digits are all 2 digits "00xx", select 60 h. ••• See Dch in the table.

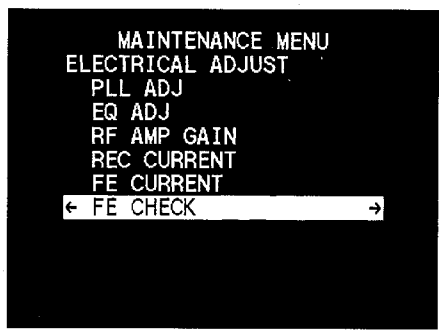
(3) When the display data of except for 10 h, 60 h are 2 digits, select 58 h. ••• See Bch in the table.

REC CURRENT (h)		Ach	Bch	Cch	Dch
Large	10 :	0A62	010E	2458	007A
↑	18 :	08E2	00A8 ←	1B89	0066
	20 :	0685	00B0	14DB	0053
	28 :	04E1	00CD	0EFD	003C
	30 :	03B1	00D0	0C1C	0052
	38 :	0321	00DF	09AA	0052
	40 :	01E7	00D6	0854	0056
	48 :	0133	00CB	078B ←	002C ←
	50 :	012E	00ED	082A	004E
	58 :	0133	00E1	084C	0047
↓	60 :	0108 ←	012A	0983	0055
Small	CUR :	60	58	50	60

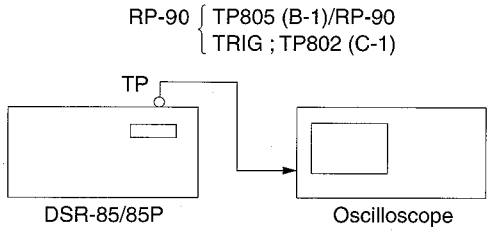
30 h to 60 h of each REC current are adjustment values.

4-6-5. FE CHECK/ADJ

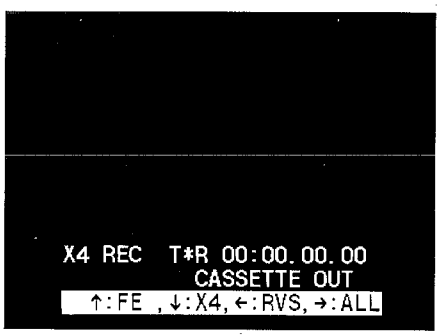
Select "FE CHECK" using the [↑], [↓] keys.

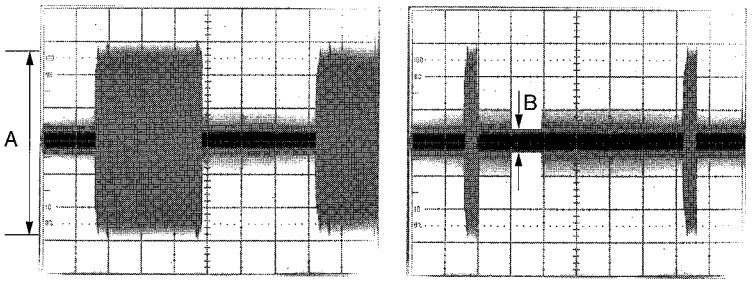


[Connection diagram]



1. Confirm that the S801/RP-90 is "0", insert a blank tape. (Pressing the keys in the order of [TC PRESET] → [RESET] → [SET], and setting the TC to 00.. facilitates the work.)
2. Select "X4 REC" using the [↓] key, and enter the adjustment mode.
3. Press the [PLAY] and [REC] keys at the same time, record the TC value for 30 to 60 seconds, and stop recording.
4. Press the [←] key twice slowly, play back the recorded part, and note the level A of the waveform.
5. Select "X4 FE (VIDEO)" using the [↑], [↓] keys, and record (erase) the part that was recorded at step 3, for 20 seconds by pressing the [PLAY] and [REC] keys at the same time.
6. Press the [←] key twice slowly, and play back the part that was recorded at step 5 and confirm that the level is 30 % or less.
7. Set the S801/RP-90 to 1, and perform steps 2 to 6.
8. Reset the S801/RP-90 to 0.





Spec. B ≦ A×0.3

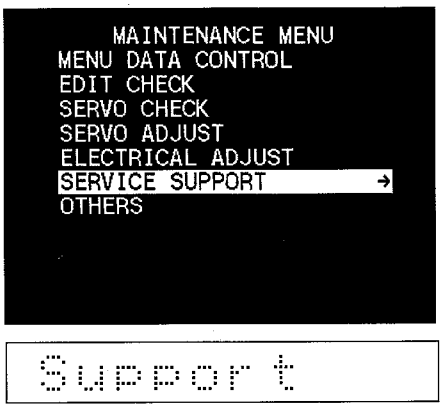
Note : If the "Spec." is NG, enter the "FE CURRENT" adjustment mode. Check the "FE CURRENT" again increasing the data in 10 h unit (Upper limit : 75 h).

4-7. SERVICE SUPPORT

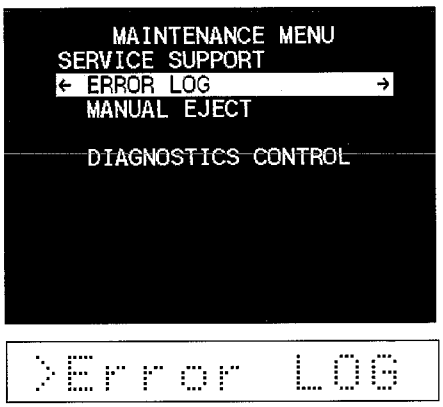
Displays the error codes and error contents which occurred in the past and diagnoses the system and devices.

Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to "SERVICE SUPPORT" which is displayed with a white background using the [↑], [↓] keys.



3. Press the [→] key.
   "SERVICE SUPPORT" is selected and its lower layer submenu appears.



4. Move the cursor displayed with a white background to a desired item using the [↑], [↓] keys.
5. Press the [→] key.
   The lower layer submenu appears.
6. Move the cursor displayed with a white background to a desired item using the [↑], [↓] keys.
7. Press the [→] key to execute the selected item.
   (Refer to the respective menu description for the check procedure after execution.)
8. After completing the check, press the [MENU] key to return to the main menu.
9. To check other menus and submenus, repeat steps 4 to 8.
10. Press the [MENU] key to exit the maintenance menu.

ERROR LOG

The errors which occurs in the past in this machine are displayed. (A maximum of 8 errors are displayed starting from the most recent error.)

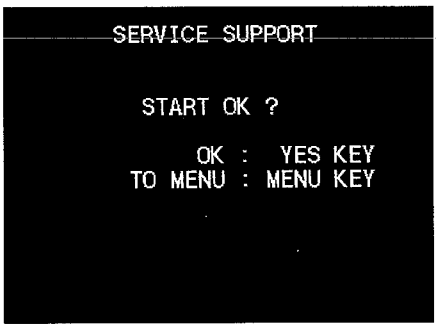
* The error which occurs most recently is displayed on the top.

Note : The servo system errors only are stored here. The ERROR-91, 92, 93, 94 and 95 are not stored.

MANUAL EJECT

When a tape cannot be ejected by the normal EJECT operation, the operating procedure how to take the tape out is displayed.

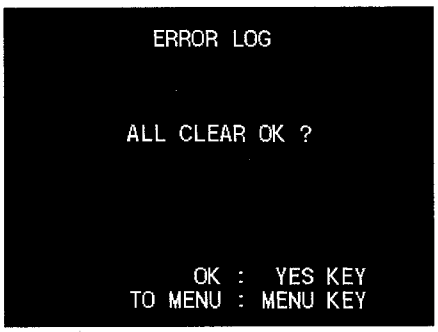
Press the [→] key to enter "MANUAL EJECT".
Take the tape out in accordance with the instruction given on the display.



DIAGNOSTICS CONTROL

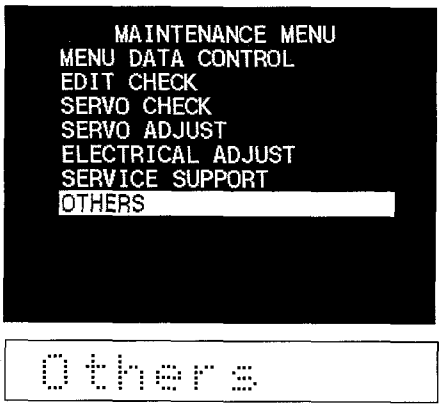
All errors which displayed on the ERROR LOG are cleared.

Press the [→] key to enter "CLEAR ERROR LOG"
Clear errors in accordance with the instructions given on the display.



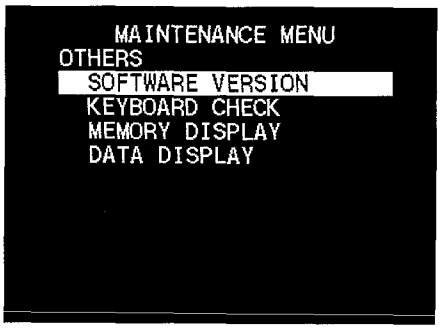
4-8. OTHERS

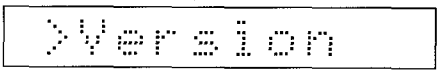
Enables to check the software version, keyboard and others.



Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to "OTHERS" which is displayed with a white background using the [↑], [↓] keys.



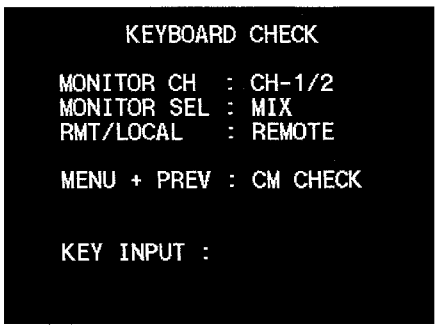


3. Press the [→] key.
   "OTHERS" is selected and its lower layer submenu appears.
4. Move the cursor displayed with a white background to a desired item using the [↑], [↓] keys.
5. Press the [→] key to execute the selected item.
   (Refer to the respective menu description for the check procedure after execution.)
6. After completing the check, press the [MENU] key to return to the main menu.
7. To check other menus and submenus, repeat steps 4 to 8.
8. Press the [MENU] key to exit the maintenance menu.

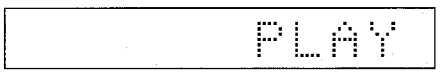
KEYBOARD CHECK

Checks the keys, slide switches and display system (time counter), and displays the CM information.

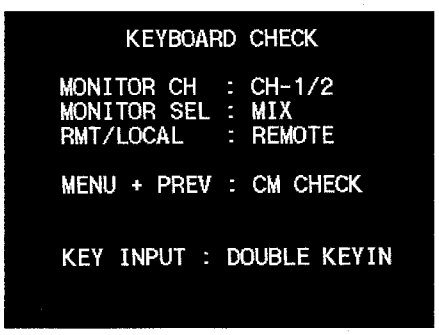
1. Pressing the [SET] ([YES]) key enters the KEYBOARD CHECK.
   Note : Once the machine enters the KEYBOARD CHECK, the machine cannot exit the KEYBOARD CHECK without turning off the main power.
   Insert a tape before entering the KEYBOARD CHECK in order to display the CM information.

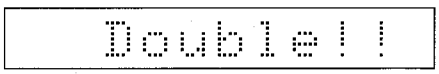


2. Setup of all switches on the sub control panel are shown on the monitor. All indications on the time counter turn on at the same time.



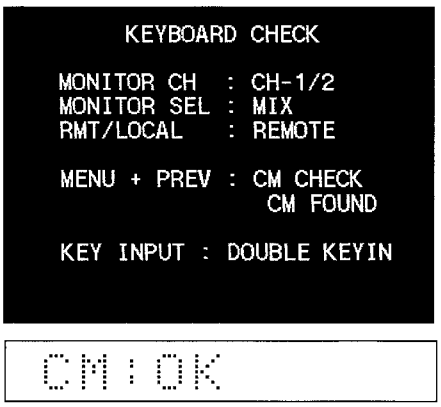
3. Pressing any key or changing the switch setup releases the all indications turning-on condition. Information of the changed switch or information of the pressed key is displayed. However, when two more keys are pressed simultaneously, the display "DOUBLE KEYIN" appears.



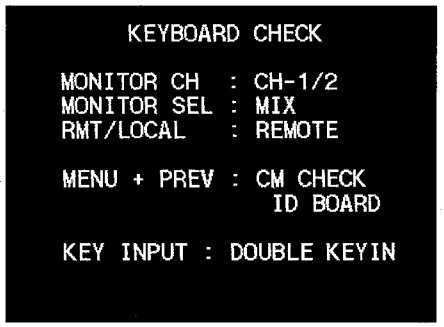


* Turn off the main power to exit the KEYBOARD CHECK mode.

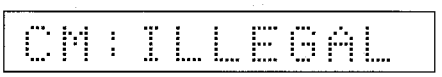
4. Pressing the [MENU] key while depressing the [←] key displays the CM information.
When a tape includes CM, the display "CM FOUND" appears.



When a tape does not include CM, the display "ID BOARD" appears.
(The time counter displays " 4 4 4".)

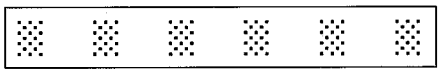


In the case when a tape other than the DVCAM or DV VTR is inserted, the display "ILLEGAL TAPE" appears.



Symptoms which are suspected as failure

① When the time counter display function is defective
- There are some segments which do not turn on even in the all-indication turning-on mode of the counter.
- There are some segments which are abnormally bright or dark.
- There are some segments which turn on when fingers are removed from the keys. All segments must illuminate as shown in the right when fingers are removed from the keys.



② When input key is defective
- A key name of indication "DOUBLE" is displayed even when any keys are not pressed.
  (The switch name keeps appearing when a switch setting is modified. This is normal.)
- The key name is not displayed even though the corresponding key is pressed.

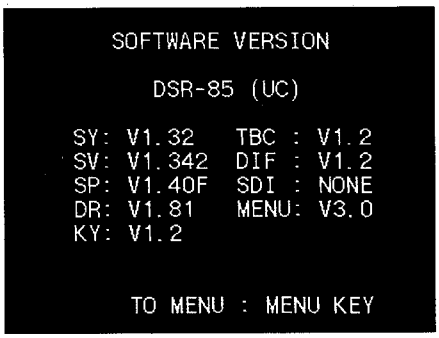
③ When key illumination is defective
- The key does not turn on even though the corresponding key is pressed.
- The key turns on even though any keys are not pressed.

④ When input switches are defective
- The setup name is not displayed even though the switch setting is modified.

⑤ When CM communication function is defective
- The indication "ID BOARD" appears when CM information is expected to display using a tape including CM.

SOFTWARE VERSION

Displays the model-wise information and software version number of this machine.



SY : Version of ICs102 and 103 on the SY-220 board.
SV : Version of ICs315 and 316 on the SY-220 board.
SP : Version of ICs610 and 611 on the SY-220 board.
DR : Version of IC105 on the SY-161 board.
KY : Version of IC1 on the KY-336 board.
TBC : Version of IC120 on the DEN-5/5P board.
DIF : Version of IC300 on the SDI-8 board.
SDI : Version of IC301 on the SDI-28 board.
MENU : Version of the setup menu.

* Contents which are shown in the display can be changed when you press [↑], [↓] keys.
  Press the [←] key or the [MENU] key to return to the maintenance menu.

MEMORY DISPLAY

* This menu is prepared for production in the factory.

DATA DISPLAY

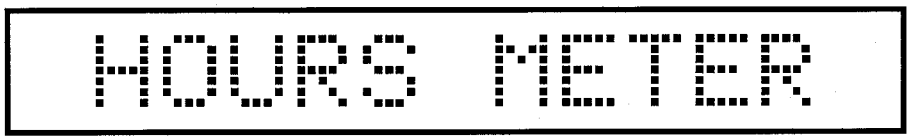
* This menu is prepared for production in the factory.

SECTION 5
PERIODIC INSPECTION AND MAINTENANCE

5-1. HOURS METER

The hours meter data is displayed on the monitor display and the time counter display area.
Therefore, the hours meter data cannot be checked without turning on the main power to the unit.
Periodic inspection is recommended to be performed using the hours meter reading.

HOURS METER



The hours meter has the four types of display mode. The accumulated elapsed hours of operation or accumulated times of operation are displayed in the respective modes. The T2, T3 and CT modes have both of resettable accumulation counter and un-resettable accumulation counter.

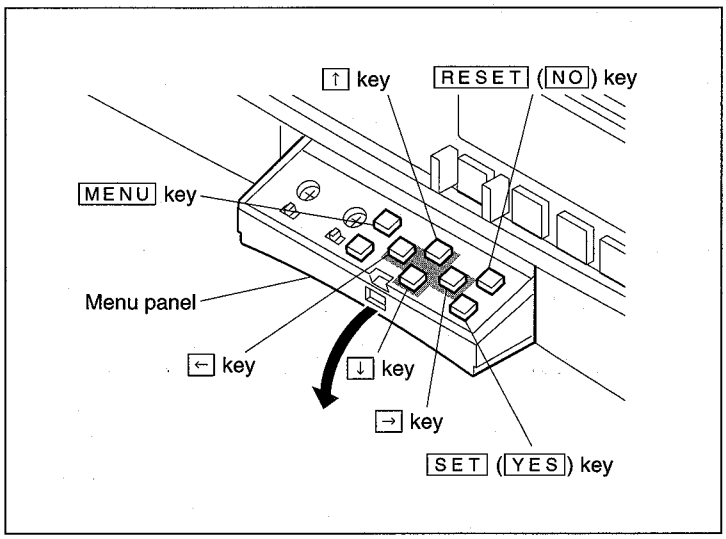
Note : The actual hours and times are obtained by multiplying the displayed number by 10.

Modes	Contents of display
T1 : OPERATION	Accumulated hours of power on
T2 : DRUM ROTATION	Accumulated hours of drum rotation at the threaded-end position
T3 : TAPE RUNNING	Accumulated hours of tape running in the respective modes of fast forward, rewind, playback, search, record and edit (except for the still mode during search)
CT : THREADING	Numbers of times of threading and unthreading

Example : The following display indicates that the accumulated hours of drum rotation at the threaded-end position is 1500 hours.

5-1-1. Displaying Hours Meter Information

1. Open the menu panel in the front bottom as shown.

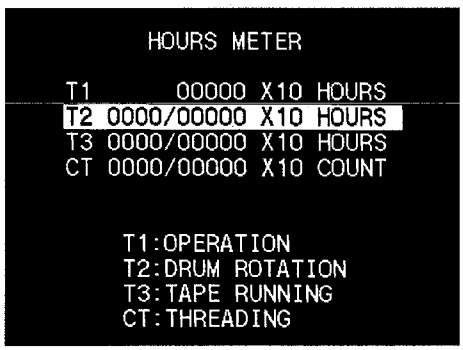


2. Press the MENU key.
3. Select HOURS METER and press the → key.
4. All of the hours meter information of T1, T2, T3 and CT appear on the monitor screen.
5. Either one of T1, T2, T3 or CT is displayed on the time counter display area. Select another item using the ↑, ↓ keys.
6. When the mode of T2, T3 or CT is selected, the resettable hours meter value appears first.
7. The un-resettable hours meter value is displayed while the → key is kept pressed.

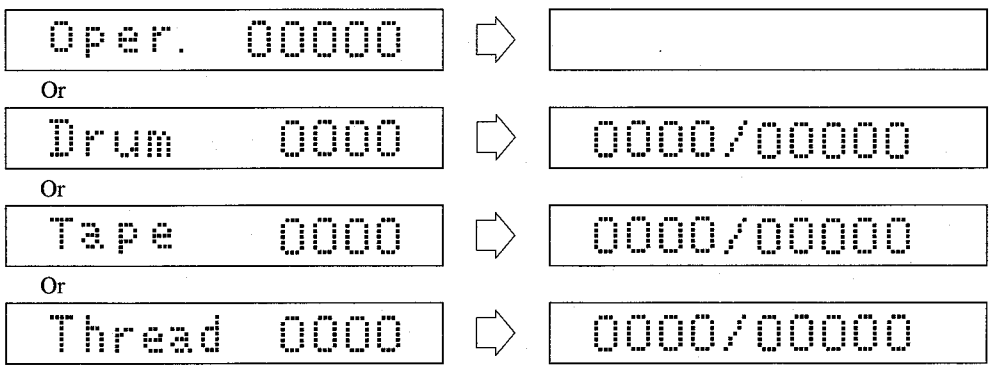
Note : When the hours meter value becomes larger and exceeds the limit of display, " — —" will appear.

8. Press the MENU key again to return to the original mode.

[Monitor screen]

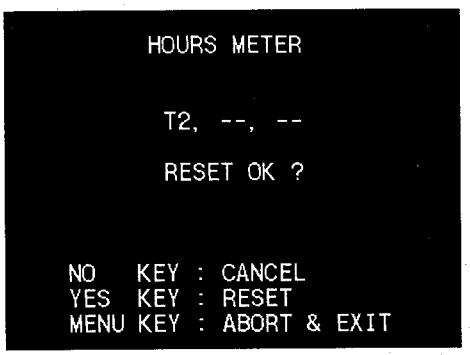


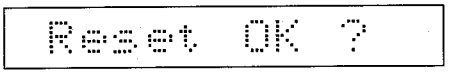
[Counter display area]



5-1-2. How to Reset Hours Meter

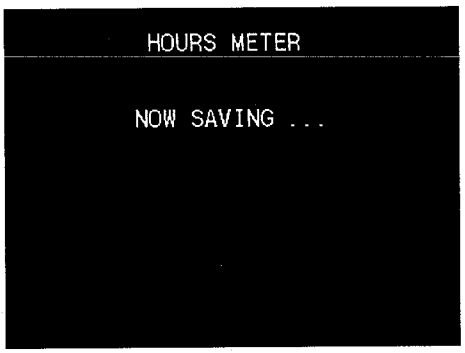
1. Set the switch S501-1 on the SY-220 board to ON.
2. Press the [MENU] key.
3. Select HOURS METER using [↑], [↓] keys.
4. Select the desired item to reset using [↑], [↓] keys.
5. When the [RESET] key is pressed, the display changes to "0000" which blinks.
6. When the [SET] key is pressed, a message appears requesting approval to reset, on the monitor.
7. To reset the memory, press the [SET] key again to exit the hours meter display mode.





Note : **The following message appears while saving data into memory during reset.**
If the main power is turned off while the message appears, the memory will not be reset correctly. Do not turn off the main power while the display appears.

8. Set the switch S501-1 on the SY-220 board to OFF.



5-2. MAINTENANCE UPON COMPLETION OF REPAIR

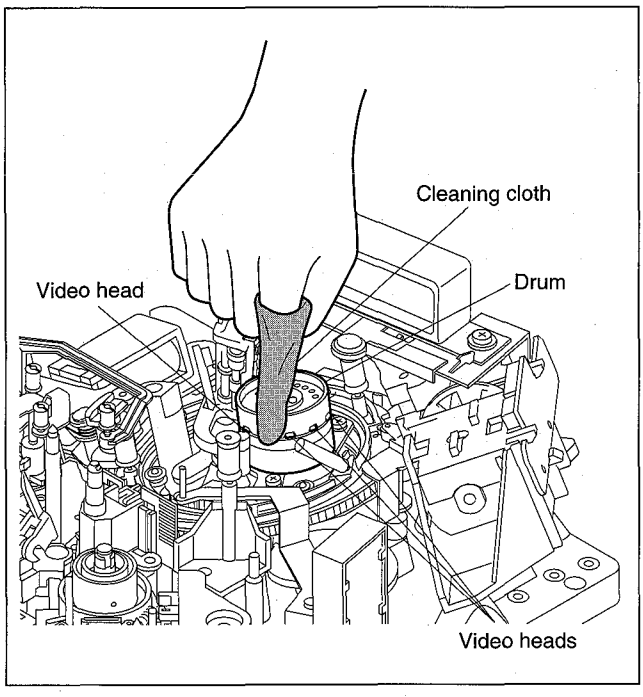
Whenever repairing a unit is completed, perform the following maintenance work regardless of the elapsed operating hours of the unit.

1. Video head cleaning
   (Refer to section 5-2-1 for cleaning procedure.)
2. Tape running path cleaning
   (Refer to section 5-2-2 for cleaning procedure.)

Note : After a unit is cleaned, insert a cassette after cleaning fluid is dried completely.

5-2-1. Video Head Cleaning Procedure

Bring a cleaning cloth moistened with cleaning fluid in contact with the head tip gently, and rotate the drum slowly with hand for cleaning.

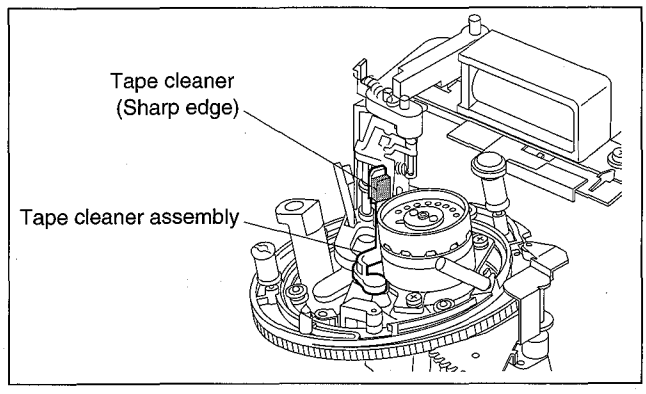


Note :
- **Never move the cleaning cloth in vertical direction with respect to the drum rotating direction (up and down direction with respect to drum) during cleaning, or never clean it vertically.**
- **After cleaning, wipe off moisture using a dry cleaning cloth.**
- **Turn off the main power when cleaning a unit.**

5-2-2. Tape Running Path Cleaning

Clean the tape guide, drum, capstan, pinch roller, tape cleaner and other parts which contact with video tape, with cleaning cloth moistened with cleaning fluid.

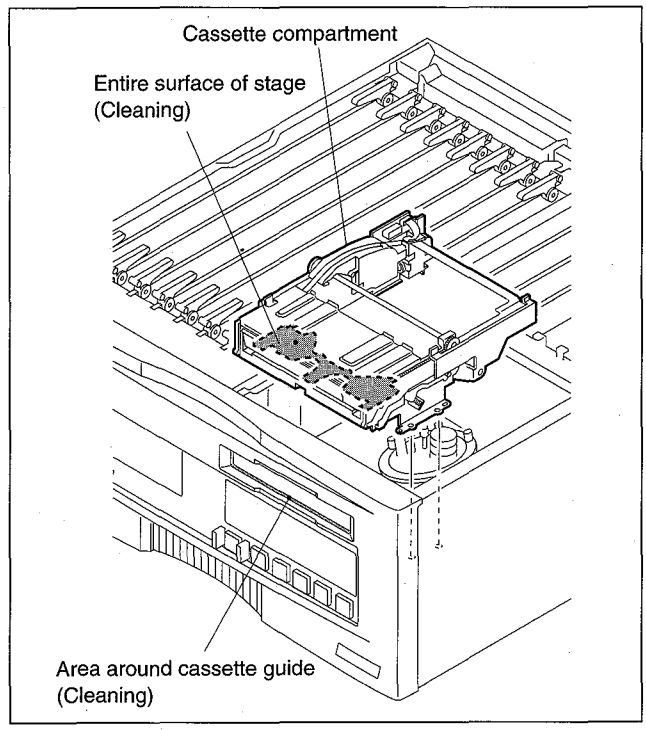
Note :
- **Be careful of the tape cleaner during cleaning because it has sharp edge.**
- **After cleaning, wipe off moisture using a dry cleaning cloth.**



5-2-3. Cassette Compartment Entrance Cleaning

Clean the area around the cassette guide of the front panel and entire surface of the stage of the cassette compartment as shown using cleaning cloth moistened with cleaning fluid.

Note : Remove the cassette compartment when cleaning a unit to prevent foreign materials from dropping into a unit.



5-3. PERIODIC INSPECTION LIST

The following table shows the reference parts replacement time which is not the warranty time of parts. Refer to the following table to establish the periodic inspection schedule which realizes the full performance and function of a unit and to extend life of a tape.
The actual parts replacement period depends on the operating environment and conditions of a unit.

☆ : Part replacement ◇ : Check (adjustment) ○ : Cleaning

	Periodic inspection items				Hours meter	Inspection time (hours)				Remarks
	Inspection items	Part number	Name	Quantity	Display mode	1500	3000	4500	6000	
Tape drive system	Drum assembly	A-8312-310-	Drum assembly (DEH-04A-R)	1	T2	☆	☆	☆	☆	
	Pinch solenoid	1-454-337-	Solenoid plunger	1	T2	–	–	–	◇	
	Reel motor (S)	A-8311-188-	RS table (S) assembly	1	T2	–	◇	–	◇	
	Reel motor (T)	A-8311-189-	RS table (T) assembly	1	T2	–	◇	–	◇	
	Limiter rubber of gear box	3-604-442-	Limiter rubber	1	CT	Replace every 200,000 times.				
	Fan motor	1-698-785-	DC fan motor	1	T1	Replace every 30,000 hours.				
	Brake shoe (S)	X-3678-873-	Brake (S) assembly	1	T2	◇	◇	◇	◇	
	Brake shoe (T)	X-3678-874-	Brake (T) assembly	1	T2	◇	◇	◇	◇	
	Head cleaner solenoid	1-454-337-	Solenoid plunger	1	T2	–	–	–	◇	
Tape run path	Capstan motor	1-698-881-	DC motor (capstan)	1	T2	–	◇	–	◇	
	Pinch roller	X-3678-746-	Pinch roller arm assembly	1	T2	☆	☆	☆	☆	
	Guide roller TG-1	X-3604-988-	TG-1 guide roller assembly	1	T2	–	◇	–	◇	
	Guide roller TG-2	X-3604-987-	TG-2 guide roller assembly	1	T2	–	◇	–	◇	
	Guide roller TG-3	X-3604-989-	TG-3 guide roller assembly	1	T2	–	◇	–	◇	
	Guide roller TG-6	X-3604-991-	TG-6A guide roller assembly	1	T2	–	◇	–	◇	
	Guide roller TG-7	X-3604-986-	TG-7 guide roller assembly	1	T2	–	◇	–	◇	
	Guide roller TG-8	A-8279-049-	Loading ring (A) assembly	1	T2	–	◇	–	◇	
	Guide roller TG-9	A-8279-049-	Loading ring (A) assembly	1	T2	–	◇	–	◇	
	Guide roller TG-10	A-8279-049-	Loading ring (A) assembly	1	T2	–	◇	–	◇	
	Guide roller TG-12	X-3604-922-	TG-12 assembly	1	T2	–	◇	–	◇	
	Tape running surface (including tape cleaner)	–	–	–	–	○	○	○	○	
Cleaner	Head cleaner	A-8316-539-	HC assembly (2)	1	T2	☆	☆	☆	☆	
Others	Cassette compartment block	A-8312-671-	Cassette compartment assembly	1	CT	Replace every 100,000 times.				
	Cassette memory terminal	A-8311-617-	MIC holder (E) assembly	1	T2	◇○	◇○	◇○	◇○	

T1 : OPERATION T2 : DRUM ROTATION T3 : TAPE RUNNING CT : THREADING

Note 1: Life of a head can be shortened in the atmosphere of high humidity, high temperature or in dusty area. Use of the unit in an atmosphere which is air-conditioned and dust is less, is recommended. Storage of tape under constant temperature and constant humidity is recommended.

5-5

SECTION 6
REPLACEMENT OF MECHANICAL PARTS

6-1. GENERAL INFORMATION FOR PART REPLACEMENT AND ADJUSTMENT

6-1-1. Preparation Before Starting Part Replacement

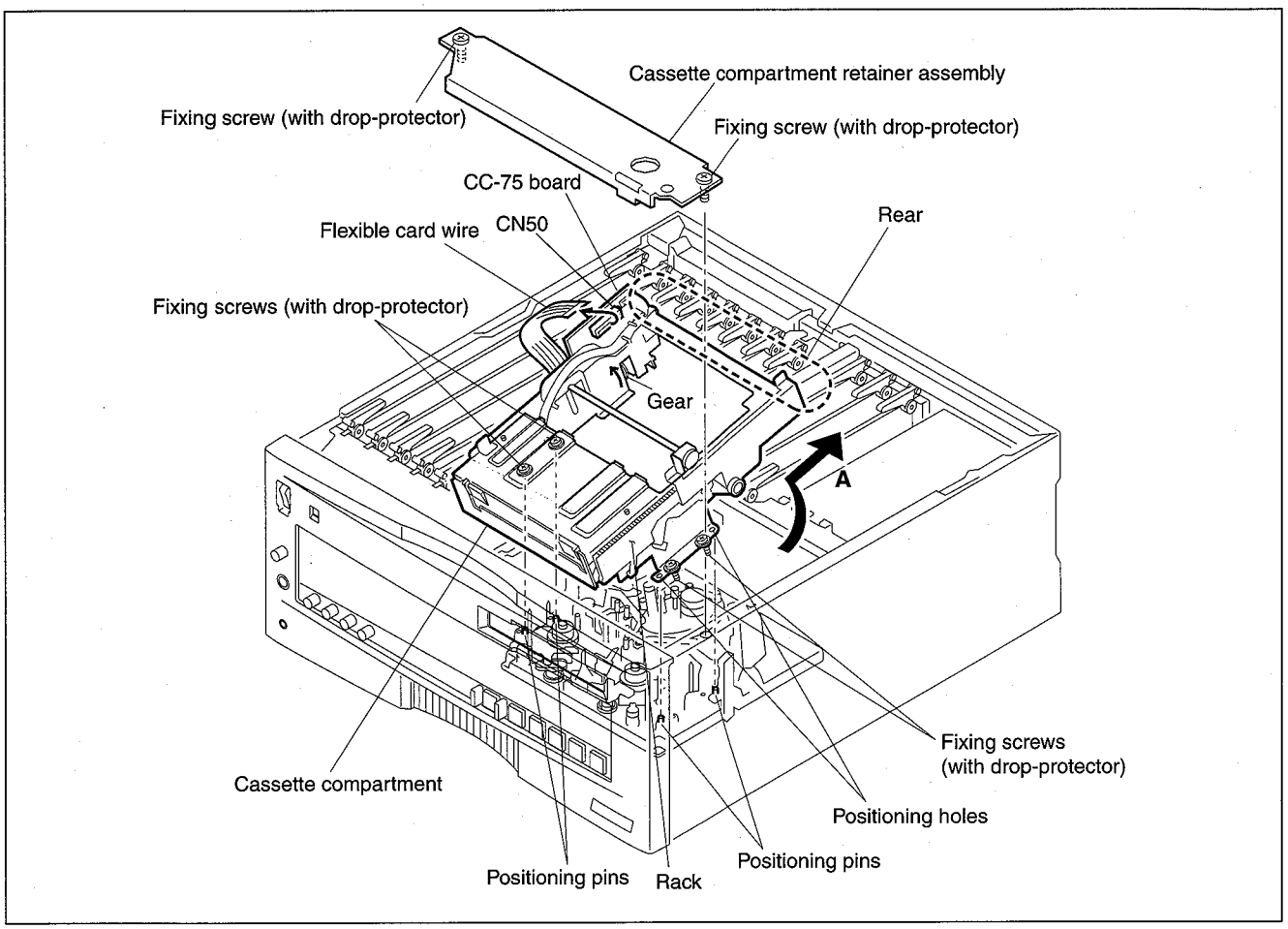
- When performing part replacement or mechanical adjustment, remove the cassette compartment from the unit unless otherwise specified.
- When the connector of the cassette compartment is removed, the protection circuit starts functioning.
  Refer to section "3-10. OPERATING THE VTR WITHOUT A CASSETTE TAPE" when operating the unit without inserting a cassette tape.

Removal

1) Remove the top cover. (Refer to section 3-4.)
2) Pull the flexible card wire out of the connector (CN50) on the CC-75 board.
3) Remove the cassette compartment retainer assembly by loosening the 2 screws that hold it.
   - The screws cannot fall out of the cassette compartment retainer assembly because they have a drop-protector.
4) Loosen the four screws fixing the cassette compartment.
   - The screws cannot fall out of the cassette compartment because they have a drop-protector.
5) Rotate the gear of the cassette compartment in the direction of arrow and back the rack about 5 mm.
6) Remove the cassette compartment in the direction of arrow **A** by lifting up the rear side of the cassette compartment slightly.

Attachment

Refer to section "3-5. REMOVAL AND ATTACHMENT OF THE CASSETTE COMPARTMENT" for details on how to attach the cassette compartment.



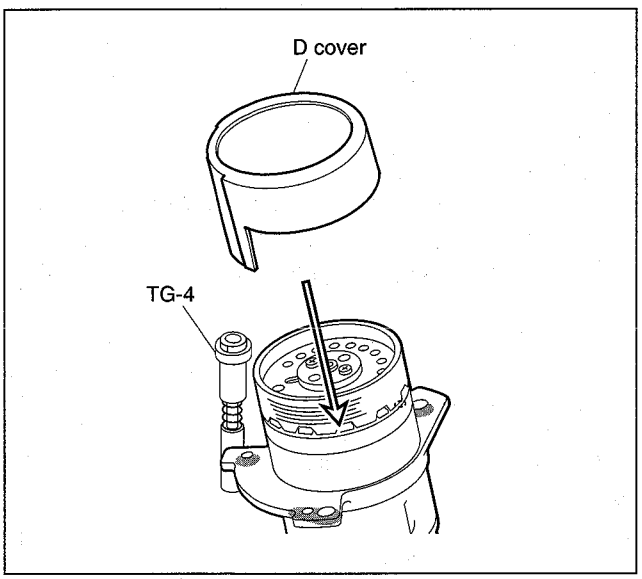
6-1-2. Head Cleaner and Drum Assembly

1. Head Cleaner Assembly
   When replacing the mechanical parts, remove the head cleaner assembly as needed. (Refer to section 6-30.)

2. Drum Assembly
   When replacing the drum assembly or the respective tape guides or other mechanical parts, perform the replacement work with the D cover attached to protect the tape running surface from scars.

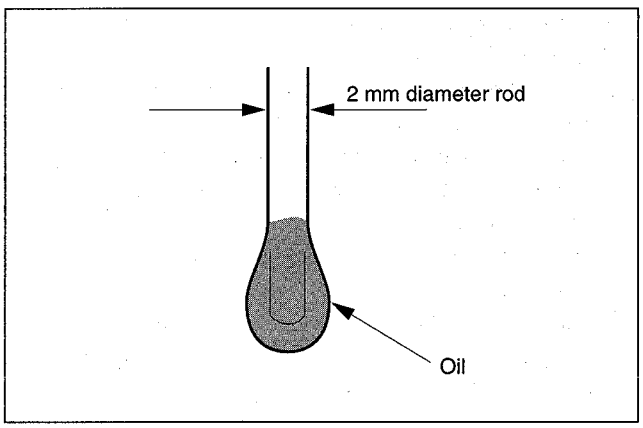
Tool

D cover : J-6443-360-A



6-1-3. Oil and Grease

1. Oil
   Sony part number : 7-661-018-18
   Be sure to use only the specified oil when oil is required during part replacement. If other than the specified oil is used, major malfunctions may result due to differences in oil viscosity and its components.
   If an oil containing dirt is used, the shafts and bearings may be damaged and major malfunctions may result.
   One drop of oil is defined as follows:
   The amount of oil which will adhere to the end of a rod of 2 mm diameter, as shown.



2. Grease
   Sony part number : 7-651-000-10 (Grease SGL-601)
   Be sure to use the specified grease when applying it to the moving parts.
   If other than the specified grease is used, major malfunctions may result due to differences in oil viscosity and its components.
   If a grease containing dirt is used, the shafts and bearings may be damaged causing major malfunctions.

Amount of Grease to be Coated

Coat just enough grease to leave a thin film on the surface. Wipe off any grease that oozes out into the surrounding parts with gauze or a soft cloth.

6-2. DRUM ASSEMBLY REPLACEMENT

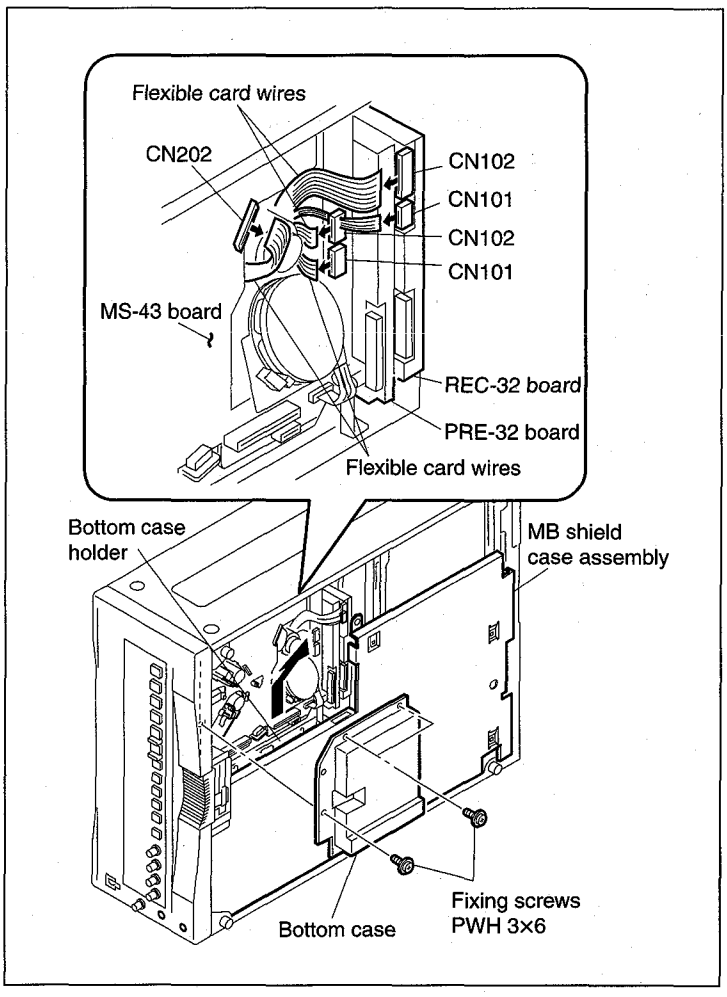
- The drum assembly is a periodic replacement part. Replace in accordance with the periodic replacement list.
- The drum assembly must be replaced in the following cases:
  (1) The rabbet guide surface of the lower drum wears out such that the correct RF envelope cannot be obtained, even after performing the tape path adjustment for best tracking.
  (2) When the rabbet guide surface or tape running surface of the lower drum is damaged.
  (3) If the drum rotation is abnormal and the VTR does not work properly due to noise or jitter.

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01

Removal

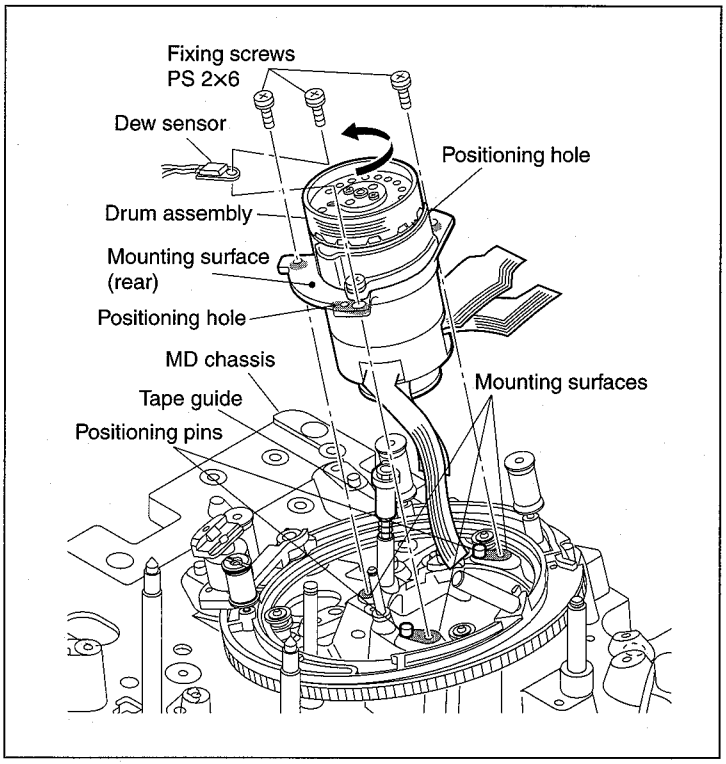
1. Place this unit with its left side down.
2. Remove the three fixing screws (PWH 3×6) from the MD chassis, and remove the bottom case in the direction of arrow.
3. Remove the flexible card wire (green) from the connector (CN202) on the MS-43 board.
4. Remove the flexible card wire (brown) from the two connectors (CN101, CN102) on the REC-32 board.
5. Remove the two flexible card wires (brown) from the two connectors (CN101, CN102) on the PRE-32 board.



6. Place the unit horizontally.

Note : Be careful not to damage the tape guides in the vicinity of the drum assembly, or the tape running surfaces of the drum assembly.

7. Remove the three screws (PS 2×6) securing the drum assembly from the MD chassis, and remove the drum assembly and dew sensor while taking care not to let it touch the various guides.



Attachment

8. Clean the mounting surface of the new drum and the mounting surface of the MD chassis using the cleaning cloth moistened with cleaning fluid.

Note : Be careful not to scratch the tape running surface of the drum assembly or the guides during cleaning.

9. Align the two positioning pins of the MD chassis with the positioning holes in the bottom of the drum assembly, then insert the drum assembly into the MD chassis.
10. While pushing the drum assembly in the direction of arrow (turning clockwise), fix the drum assembly and dew sensor with the three screws.
11. Connect the connectors and attach the disassembled parts by reversing the removal procedure from steps 5 to 1.
12. Clean the tape running surface of the drum assembly using the cleaning cloth moistened with cleaning fluid.
13. After cleaning, wipe the cleaned surface two or three times with a dry cloth.

Adjustment After Replacement

- Perform the following adjustments:
  - SW Position Adjustment. (Refer to section 7-6.)
  - AGC Reference Adjustment. (Refer to section 4.)
  - Tape Path Adjustment. (Refer to section 7.)
  - PLL F0 Adjustment. (Refer to section 4.)
  - PLL DELAY Adjustment. (Refer to section 4.)

6-3. REEL TABLE REPLACEMENT

• The reel table replacement procedure is the same for both the supply side and the takeup side.

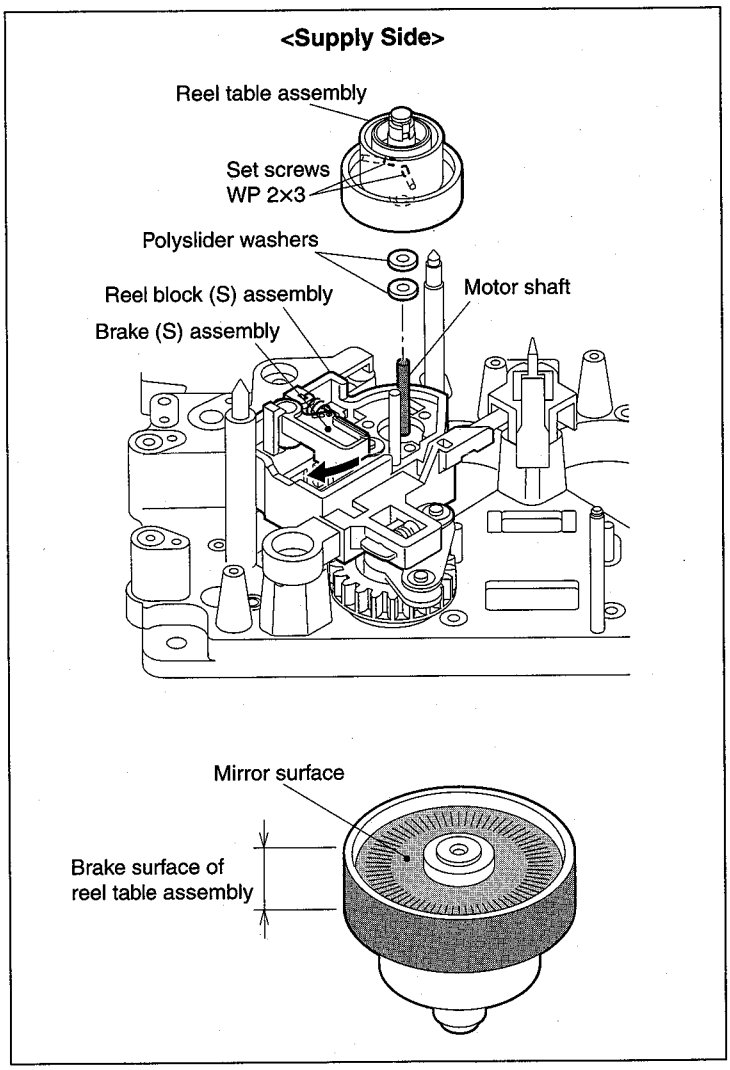
Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01
L shaped hexagon wrench (width across flat 0.89 mm) :
7-700-736-06

Removal

1. Insert an L-shaped hexagon wrench into the round holes (two holes) on the sides of the reel table when viewing the reel table from the side. Loosen the two set screws (WP 2×3) of the reel table, then remove the reel table.
2. Loosen the two set screws of the other reel table in the same manner as step 1, then remove the reel table assembly.

Note : A polyslider washer of 2 mm dia. is inserted beneath the reel table bearing for adjusting the height of the reel table.
Be careful not to lose the polyslider washer when removing the reel table as the bent polyslider washer may stick to the bottom of the reel table. Also take care not to let the mirror block at the bottom of the reel table assembly become dirty, and take care not to touch the brake surface of the reel table assembly.



Attachment

3. Clean the motor shaft with the cleaning cloth moistened with cleaning fluid.
4. Insert the new reel table assembly into the motor shaft.

Note : Tighten the set screws of each reel table assembly after checking the height of each reel table.

Adjustment After Replacement

5. Adjust the reel table height.
(Refer to section 6-3-1.)

6-3-1. Checking and Adjusting the Reel Table Height

• Be sure to perform this check and adjustment after replacing the reel block assembly, or after removing or replacing the reel table.
• Pay particular attention when adjusting the reel table height as it is used as the reference of the tape running system.

Tools

Reel table height gauge : J-6442-570-A
Reel table reference plate : J-6442-470-A
Cleaning cloth : 7-741-900-53
Cleaning fluid : 9-919-573-01
L shaped hexagon wrench (width across flat 0.89 mm) : 7-700-736-06

Check Procedure

1. Confirm that the unit is in the unthreaded-end state.
2. Turn the gear of the reel position motor assembly until the reel table is moved to the standard cassette position.
3. Clean the surface of the reel table reference plate with the cleaning cloth moistened with cleaning fluid.
4. Place the reel table reference plate in the position where a cassette must be placed. Remove play using the adjustment screws.
5. Clean the surface of the reel table height gauge with the cleaning cloth moistened with cleaning fluid.
6. Move the reel table height gauge from the three directions as shown by the arrow, toward the supply or takeup reel table. Confirm that the respective specifications are satisfied.

   Specification : The reel table height must be in between the passing surface and stopping surface of the reel table height gauge.

7. Remove the reel table reference plate.
8. Turn the gear of the reel position motor assembly until the reel table is moved to the mini-cassette position.
9. Remove the stop washer 2.3 and the spring, and move the cassette memory terminal assembly in the direction of the arrow.
10. Change position of the reel table reference plate and select its mini-cassette position. Repeat step 4.
11. Repeat step 6 and confirm that the specification is satisfied.
12. If either specification is not satisfied, proceed to step 13 for adjustment. Repeat the adjustment until the specifications are satisfied at both of the standard cassette position and the mini cassette position.
    When the specifications are satisfied, proceed to step 15.

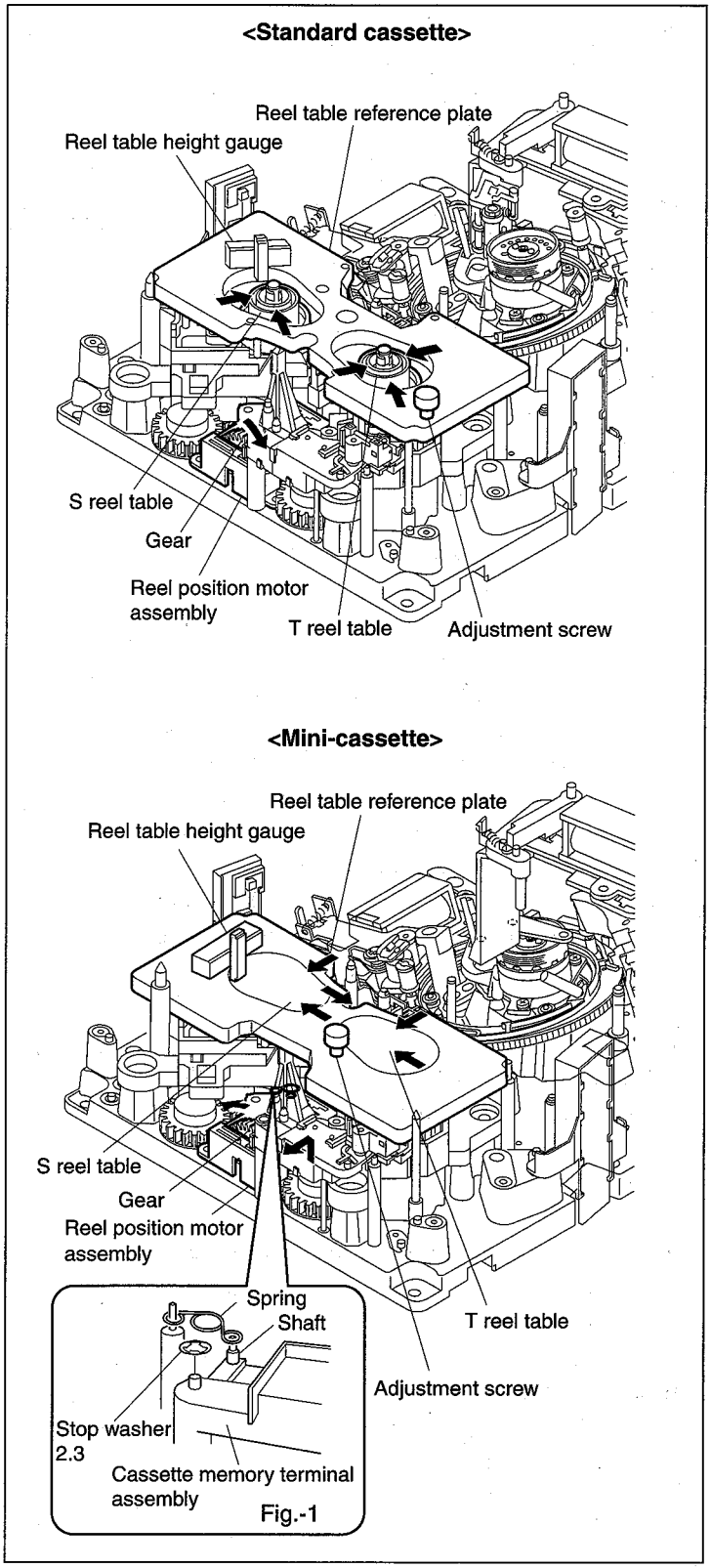


Fig.-1

Adjustment Procedure

13. Remove the reel table.
14. Increase or decrease the number of polyslider washers which are inserted into the reel motor shaft until the specifications are satisfied.

Adjustment polyslider washers (diameter : 2 mm)

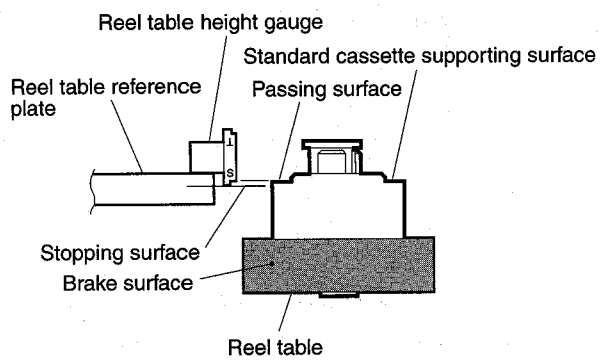
0.13 mm thickness : 3-701-437-01
0.25 mm thickness : 3-701-437-11
0.5 mm thickness : 3-701-437-21
0.05 mm thickness : 3-701-437-91

15. While gently pressing the supply or takeup reel table downward, tighten the two set screws of the reel table with the L-shaped hexagon wrench.
16. Confirm again that the specifications are satisfied.

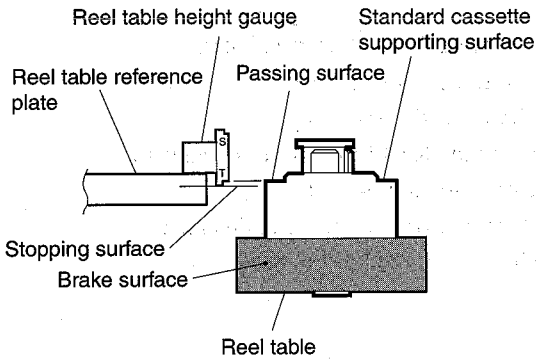
<Standard cassette>

Specification : The reel table height must be in between the passing surface and stopping surface of the reel table height gauge.

<Supply reel table height>



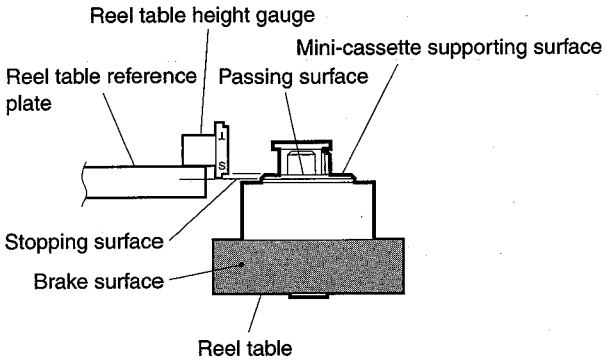
<Take-up reel table height>



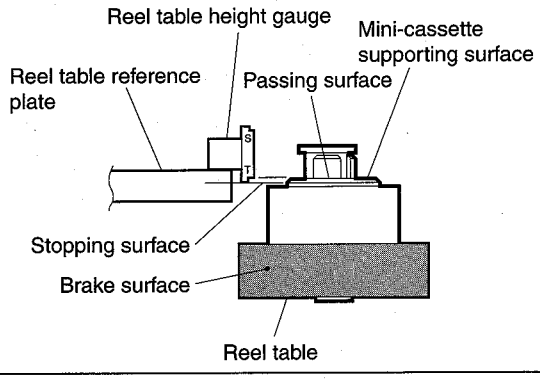
<Mini-cassette>

Specification : The reel table height must be in between the passing surface and stopping surface of the reel table height gauge.

<Supply reel table height>



<Take-up reel table height>



6-4. BRAKE ASSEMBLY (SUPPLY AND TAKEUP) REPLACEMENT

- The brake assembly replacement procedure is the same for both the supply side and the takeup side.
- The brake (S) assembly and the brake (T) assembly are pressed against the S and T reel tables when the main power is on or off.
- When a cassette is inserted while the power is turned on, the S-side and the T-side brake assemblies are detached from the reel tables. The brake (S) assembly is pressed against the S reel table during threading and unthreading when the threading ring is revolving.
- The T and the S reel brake linings are kept detached from the reel tables during the PLAY, STOP, REW, FFWD, SEARCH and REV modes.
- Press the [EJECT] key to let the unit enter the EJECT mode. When the EJECT mode is completed, the S-side and the T-side brake assemblies are pressed against the reel tables in a few seconds.

Removal

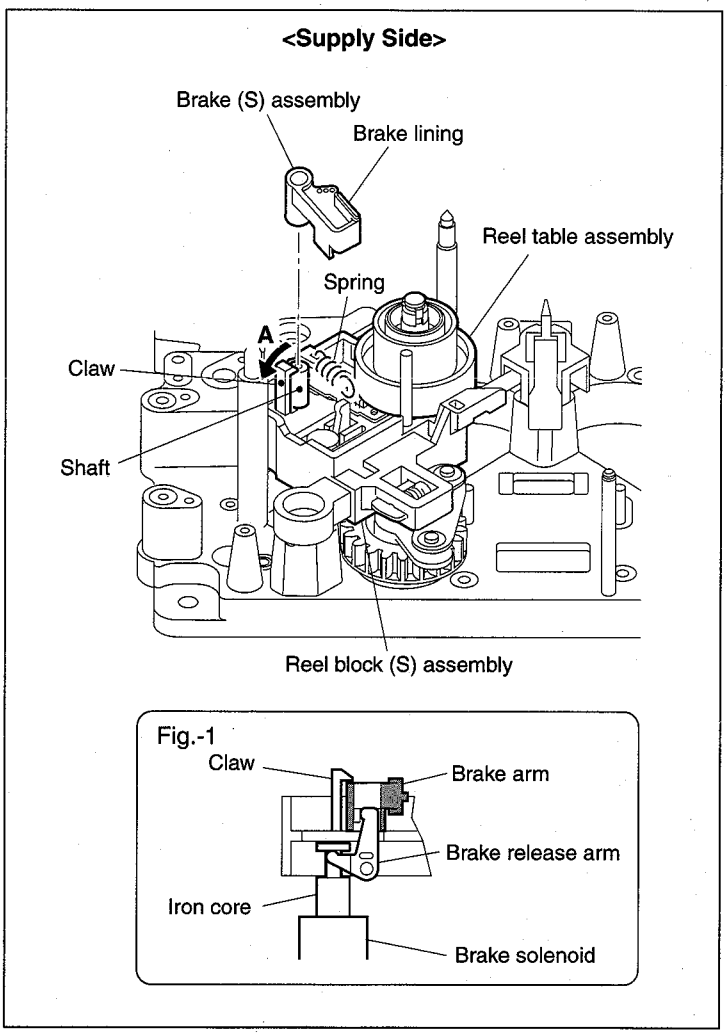
1. Remove the spring from the brake assembly.
2. While slanting the claw of the reel motor plate in the direction of arrow **A**, remove the brake (S) assembly. Be careful not to break the claw during removal.

Attachment

3. Attach a new brake (S) assembly by reversing the removal procedure from steps 2 to 1. (Fig.-1.)

Adjustment After Replacement

- Perform the Reel Brake Release Check. (Refer to section 6-4-3.)
- Perform the Reel Brake Release Adjustment. (Refer to section 6-4-3.)
- Perform the Brake Torque Adjustment. (Refer to sections 6-4-1 and 6-4-2.)



6-4-1. Brake Torque Adjustment and Check (Supply)

Tools

Brake torque gauge (CW) : J-6442-170-A
Brake torque gauge (CCW) : J-6442-460-A

Adjustment Procedure

1. Move the reel block (S) assembly to the standard cassette position.
2. Place the brake torque gauge (CW) to the reel table assembly.
3. Revolve the knob of the brake torque gauge (CW) in the "**A**" direction at the speed of 1 revolution/1 to 3 seconds. Confirm that the specification Ⓐ is satisfied.
   <If the unit is out of specification>
   Make adjustment by changing the hooking position of the tensile coil spring on the brake (S) assembly. (Fig.-1)

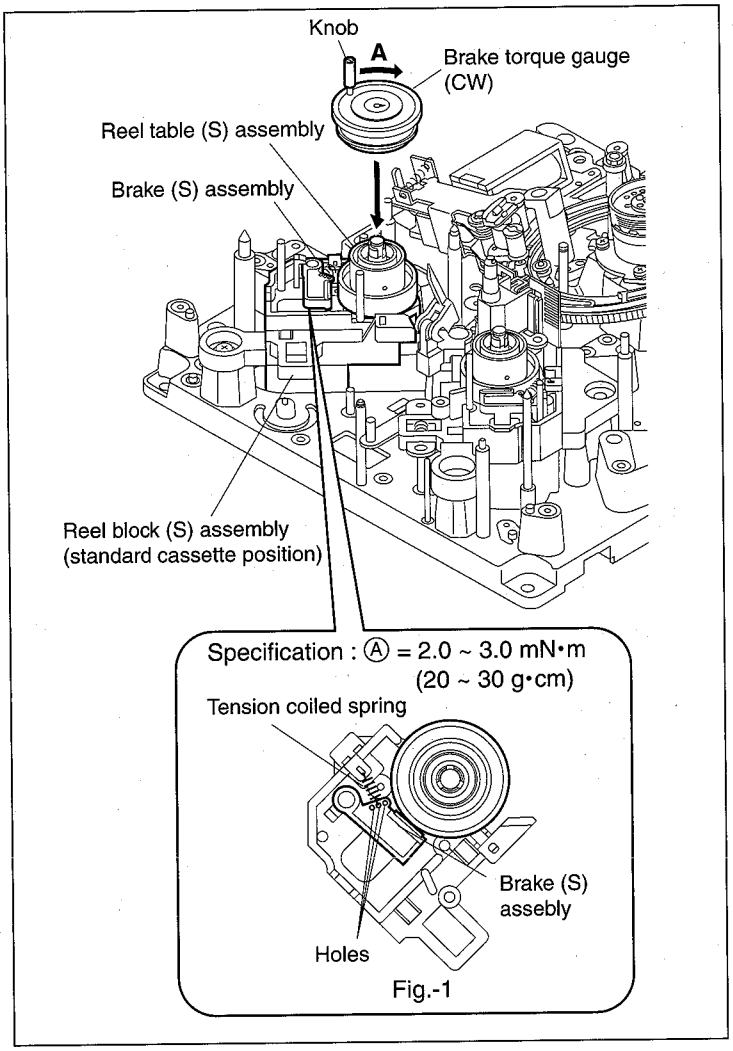
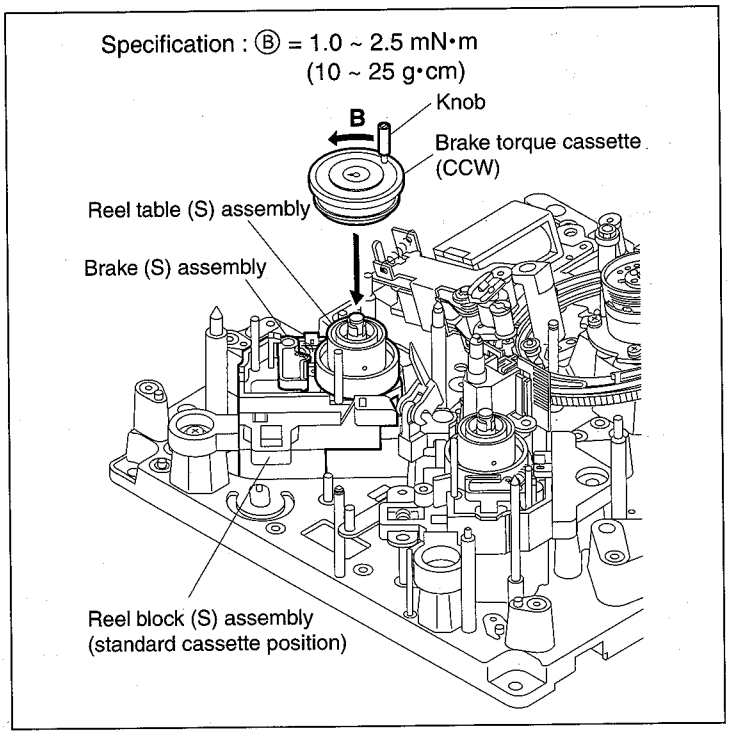


Fig.-1

4. Place the brake torque gauge (CCW) to the reel table assembly.
5. Revolve the knob of the brake torque gauge (CCW) in the "**B**" direction at the speed of 1 revolution/1 to 3 seconds. Confirm that the specification Ⓑ is satisfied.


Specification : Ⓑ = 1.0 ~ 2.5 mN•m (10 ~ 25 g•cm)
Knob
B
Brake torque cassette (CCW)
Reel table (S) assembly
Brake (S) assembly
Reel block (S) assembly (standard cassette position)

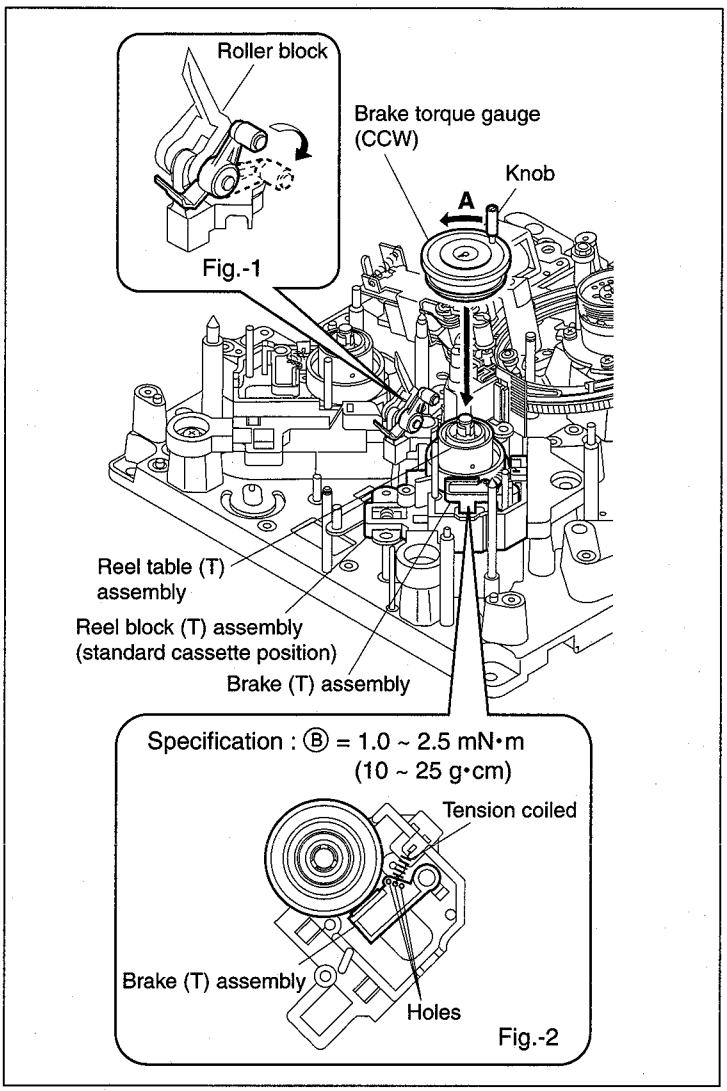
6-4-2. Brake Torque Adjustment and Check (Takeup)

Tools

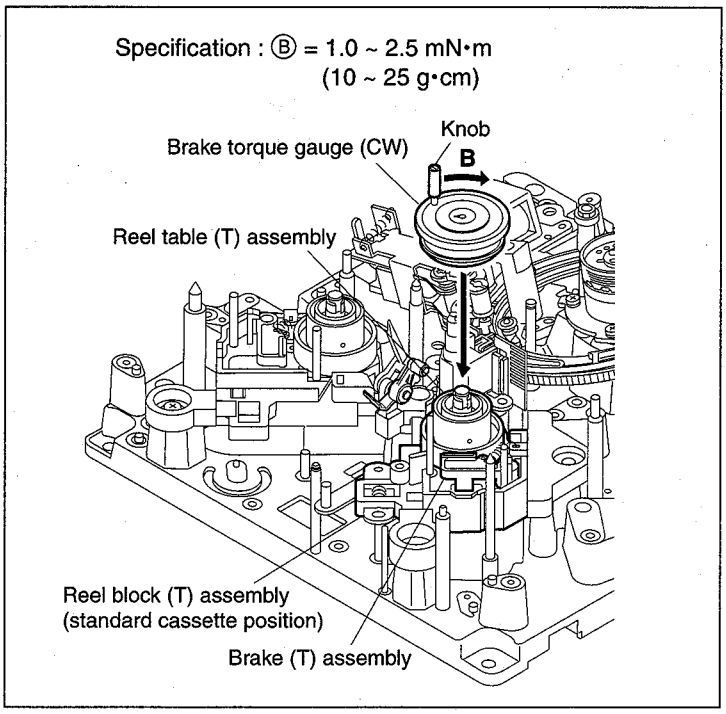
Brake torque gauge (CW) : J-6442-170-A
Brake torque gauge (CCW) : J-6442-460-A

Adjustment Procedure

1. Move the reel block (T) assembly to the standard cassette position.
2. Place the brake torque cassette (CCW) to the reel table assembly.
3. While pushing down the roller block of the CR push arm assembly with hand or driver, evolve the knob of the brake torque cassette (CCW) in the "**A**" direction at the speed of 1 revolution/1 to 3 seconds. Confirm that the specification Ⓐ is satisfied. (Fig.-1)
   <If the machine is out of specification>
   Make adjustment by changing the hooking position of the tension coil spring on the brake (T) assembly. (Fig.-2)



4. Place the brake torque cassette (CW) to the reel table assembly.
5. Revolve the knob of the brake torque cassette (CW) in the "**B**" direction at the speed of 1 revolution/1 to 3 seconds. Confirm that the specification Ⓑ is satisfied.


Specification : Ⓑ = 1.0 ~ 2.5 mN•m
(10 ~ 25 g•cm)
Brake torque gauge (CW)
Knob
B
Reel table (T) assembly
Reel block (T) assembly (standard cassette position)
Brake (T) assembly

6-4-3. Reel Brake Release Check and Adjustment

- When the brake assembly or the reel table assembly is replaced, be sure to confirm that the brake (S/T) assembly is released from the reel table.
- When the brake solenoid is replaced or removed, be sure to confirm that the brake (S/T) assembly is released from the reel table.

Tools

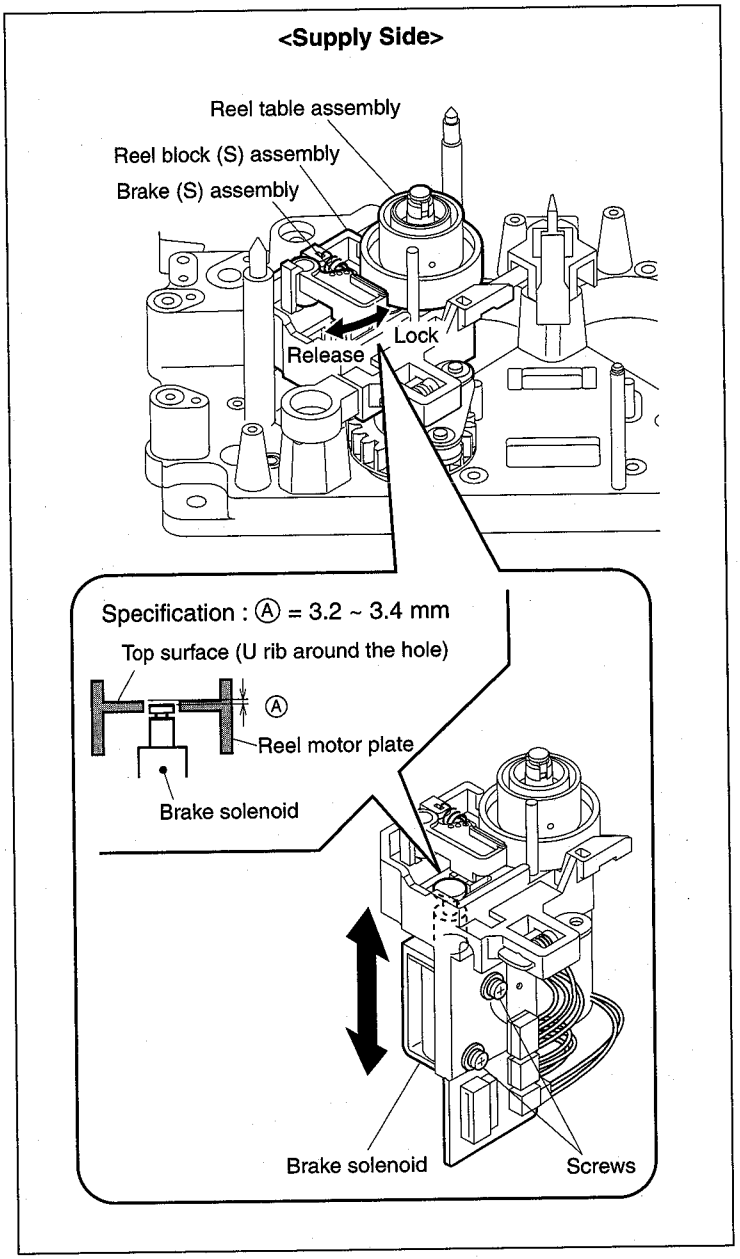
Vernier calipers

Check Procedure

1. Turn off the main power switch.
2. Confirm that the T-side brake assembly does not contact with the T reel table while the T reel table is rotating.
   If the above specification is not satisfied, check the condition of the brake assembly and the brake solenoid assembly.
   (Refer to sections 6-4 and 6-8.)
3. Confirm that the S-side brake assembly does not contact with the S reel table while the S reel table is rotating.
   If the above specification is not satisfied, check the condition of the brake assembly and the brake solenoid assembly.
   (Refer to sections 6-4 and 6-8.)

Adjustment Procedure

4. Adjust the distance between the end of the solenoid's iron core and the top surface of the reel motor plate.

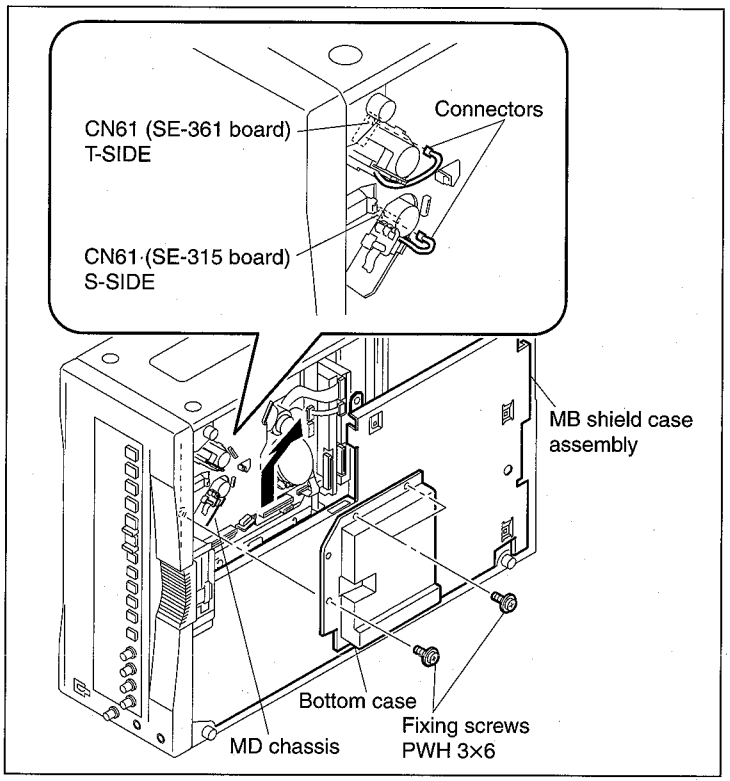


6-5. REEL ROTATION SENSOR REPLACEMENT

- The reel rotation sensor replacement procedure is the same for both the supply side and the take up side.
- Replace the reel rotation sensor as the SE-315 or SE-361 board.
  It is impossible to replace the reel rotation sensor singly.

Removal

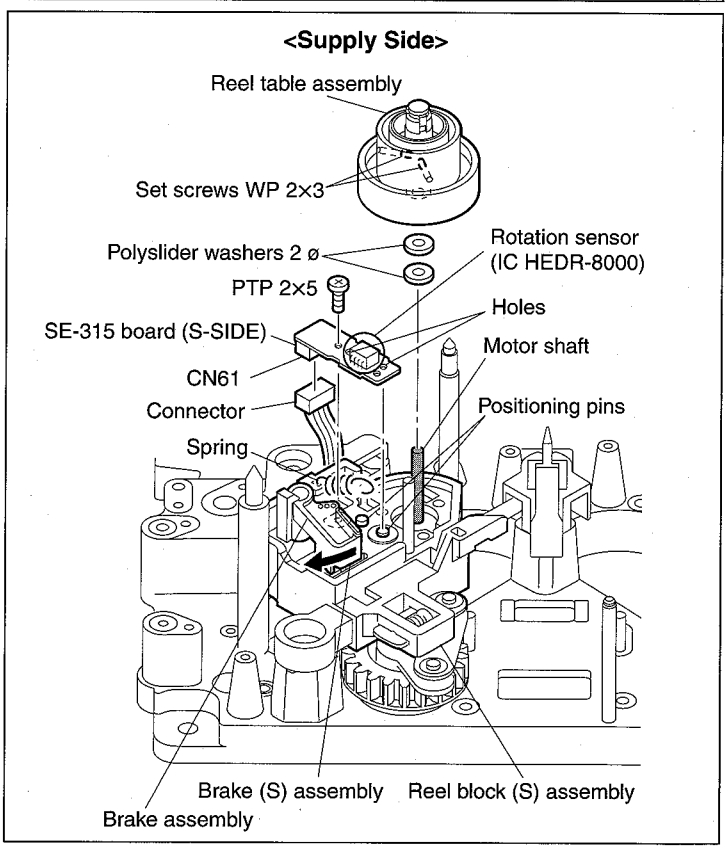
1. Place this unit with its left side down.
2. Remove the three fixing screws (PWH 3×6) from the MD chassis and remove the bottom case in the direction of arrow.
3. Remove the connector either from the SE-315 board (CN61•S side) or the SE-361 board (CN61•T side).



4. Place the unit horizontally.
5. Remove the reel table assembly. (Refer to section 6-3.)
6. Remove the spring from the reel block assembly and move the brake assembly in the direction of the arrow.
7. Remove the fixing screw (PTP 2×5), and remove either SE-315 board (S side) or SE-361 board (T side).

Attachment

8. Insert the two positioning holes of the new either SE-315 board (S side) or SE-361 board (T side), into the positioning pins of the reel block assembly. Fix them with a screw.
9. Attach the disassembled parts by reversing the removal procedure from 6 to 1.



6-6. REEL BLOCK ASSEMBLY REPLACEMENT

• The reel block assembly replacement procedure is the same for both the supply side and the takeup side.

Mode

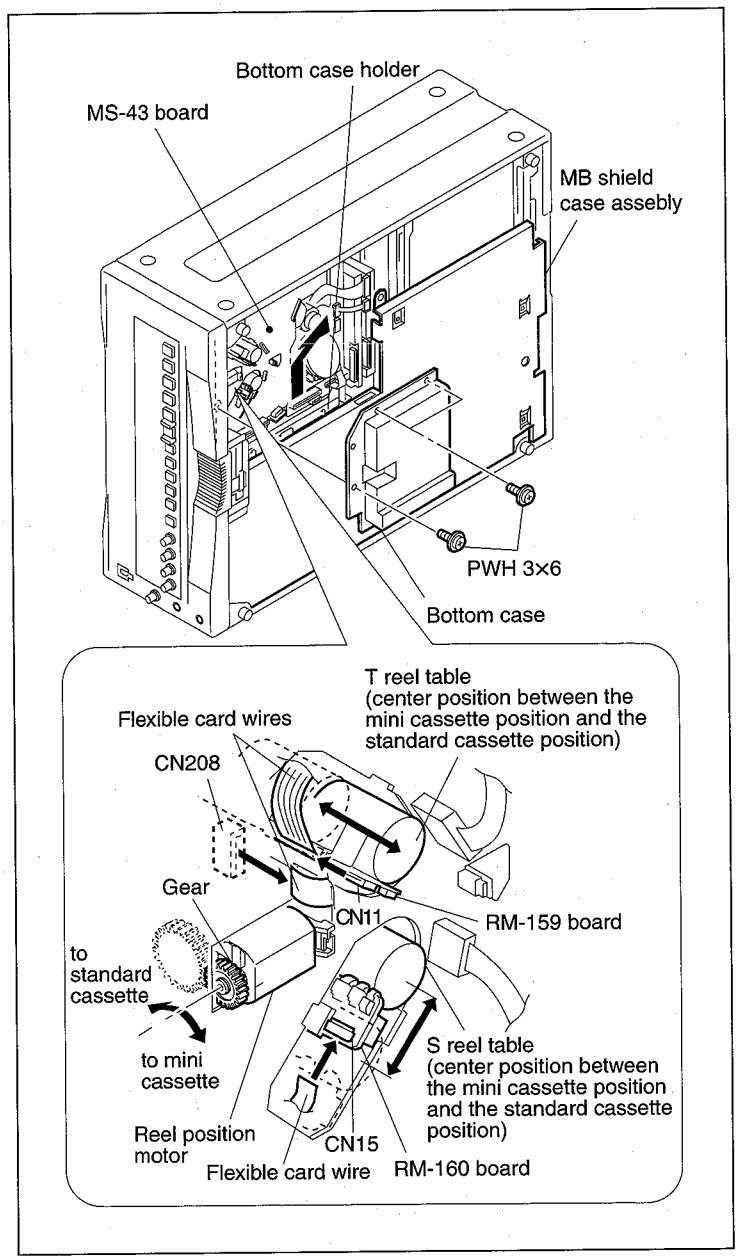
Unthreaded-end state

Tools

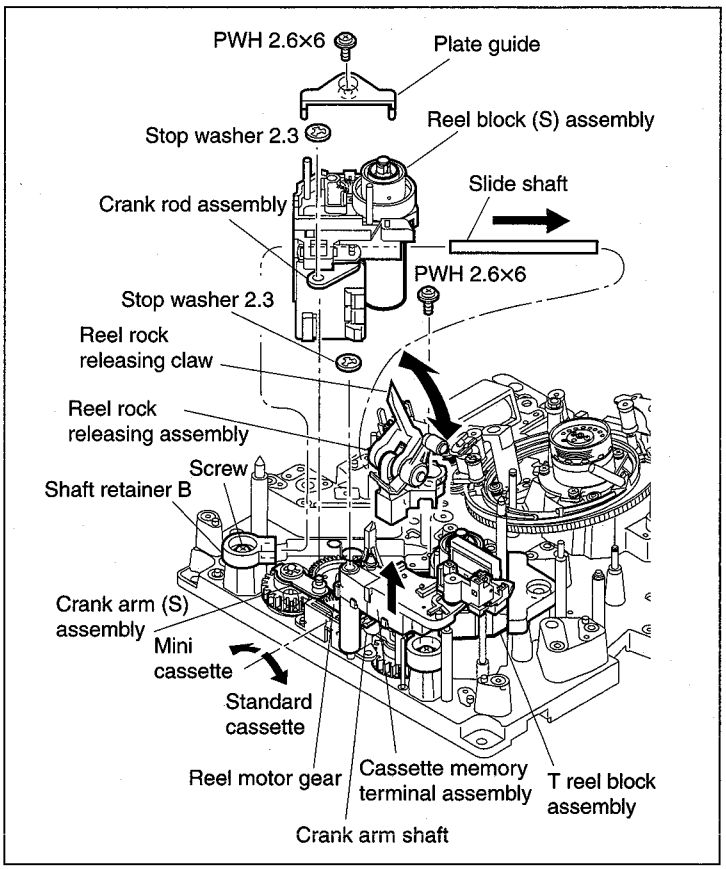
L shaped hexagon wrench (width across flat 0.89 mm) : 7-700-736-06
Sony grease (SGL-601) : 7-651-000-01
Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01

Removal

1. Place this unit with its left side down.
2. Revolve the gear of the reel position motor with hand until the reel table comes to the center position between mini cassette position and standard cassette position.
   • The reel table moves closer to the mini cassette position as viewed from the front when the gear is rotated in clockwise direction.
   The reel table moves closer to the standard cassette position when the gear is rotated in the counter-clockwise direction.
3. Remove the three fixing screws (PWH 3×6) from the MD chassis and remove the bottom case in the direction of the arrow.
4. Remove the flexible card wire from CN11 (T side) on the RM-159 board or CN15 (S side) on the RM-160 board of the reel block assembly.
   To replace the reel block assembly in the T side, remove the flexible card wire of the cassette memory terminal assembly from the connector (CN208) on the MS-43 board.

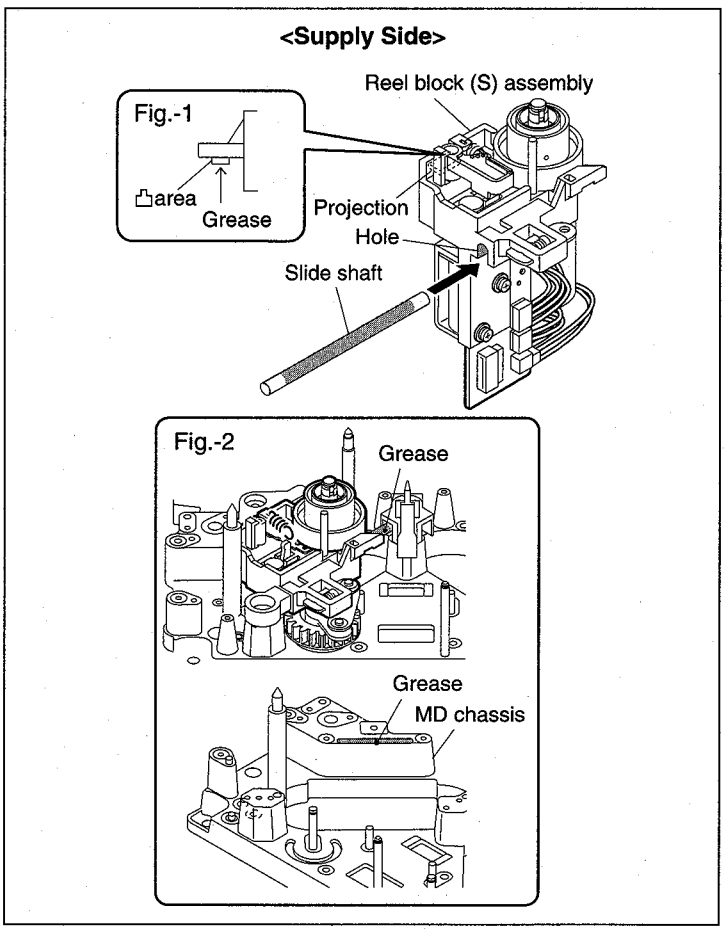


5. Place the unit horizontally.
6. Remove the stop washer 2.3 which fixes the crank rod assembly of the reel block (S) assembly to the crank arm (S) assembly.
   To replace the reel block assembly in the T side, remove the stop washer 2.3 and raise the cassette memory terminal assembly out of the crank arm shaft.
7. Remove the fixing screw (PWH 2.6×6) and remove the plate guide.
8. Loosen the screw of the shaft retainer B by rotating it 1 to 2 turns.
9. Lift up the reel lock releasing claw until it is locked. Remove the fixing screw (PWH 2.6×6) and remove the reel lock releasing assembly.
   Note : Be careful not to give scars on the slide shaft when removing and inserting the slide shaft.
10. Remove the reel block assembly together with the slide shaft.
11. Remove the slide shaft from the reel block assembly by pushing the slide shaft in the direction of arrow as shown.



Attachment

12. Clean the hole through which the slide shaft of the new reel block assembly passes through, with cleaning cloth moistened with the cleaning fluid. Clean the convex area of the projection with cleaning piece moistened with the cleaning fluid.
13. Clean the slide shaft with cleaning cloth moistened with the cleaning fluid.
14. Insert the slide shaft into the hole of the reel block assembly.
15. Coat the slide shaft, MD chassis and convex area with grease. (Fig.-1 and 2.)
16. While passing the crank rod assembly of the reel block (S) assembly into which the slide shaft has already been inserted through the crank arm (S) assembly, place the crank rod assembly on the MD chassis. Insert the slide shaft into the shaft retainer B.
17. Attach the reel lock release assembly using a screw, fix the slide shaft and lower the reel lock release assembly in the direction of arrow.
18. Tighten the screw of the shaft retainer B.
19. Attach the plate guide with the screw.
20. Confirm that the reel block (S) assembly moves smoothly with hand.
21. Attach the disassembled parts by reversing the removal procedure from steps 6 to 1.



Adjustment After Replacement

22. Perform the Reel Table Height Check. (Refer to section 6-3-1.)

6-7. REEL MOTOR REPLACEMENT

- Replace the reel motor as the RS table (S or T) assembly. The replacement procedure is the same for both the supply side and the takeup side. **(It is impossible to replace the reel motor singly.)**

Tools

L shaped hexagon wrench (width across flat 0.89 mm) :
7-700-736-06
Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01

Removal

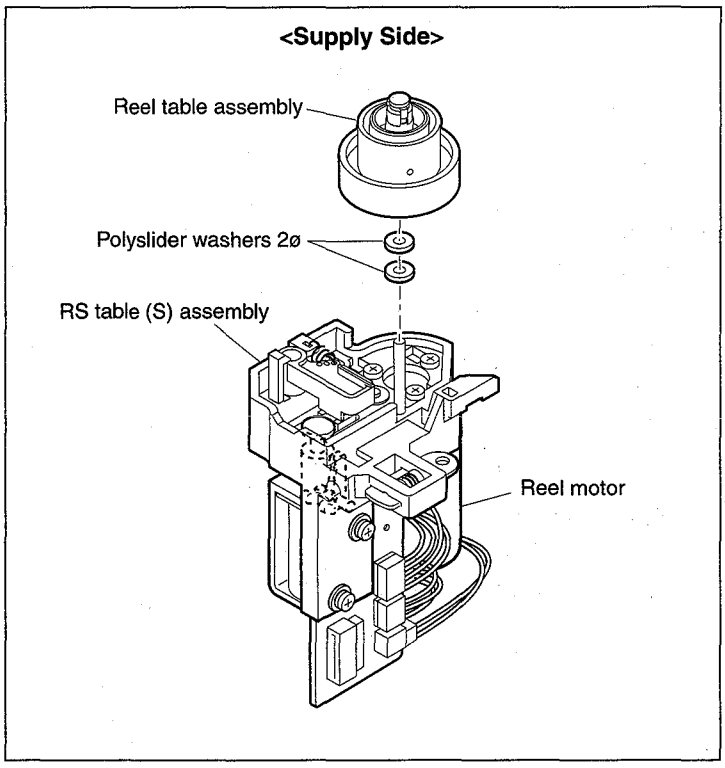
1. Remove the reel block assembly from the unit. (Refer to section 6-6.)
2. Remove the reel table assembly. (Refer to section 6-3.)

Attachment

3. Attach the reel table assembly to the new RS table assembly (S or T). (Refer to section 6-3.)
4. Attach the block assembly which is attached in the step 3 to the unit. (Refer to section 6-6.)

Adjustment After Replacement

5. Perform the Reel Table Height Check. (Refer to section 6-3-1.)



6-8. BRAKE SOLENOID REPLACEMENT

• The brake solenoid replacement procedure is the same for both the supply side and the takeup side.

Removal

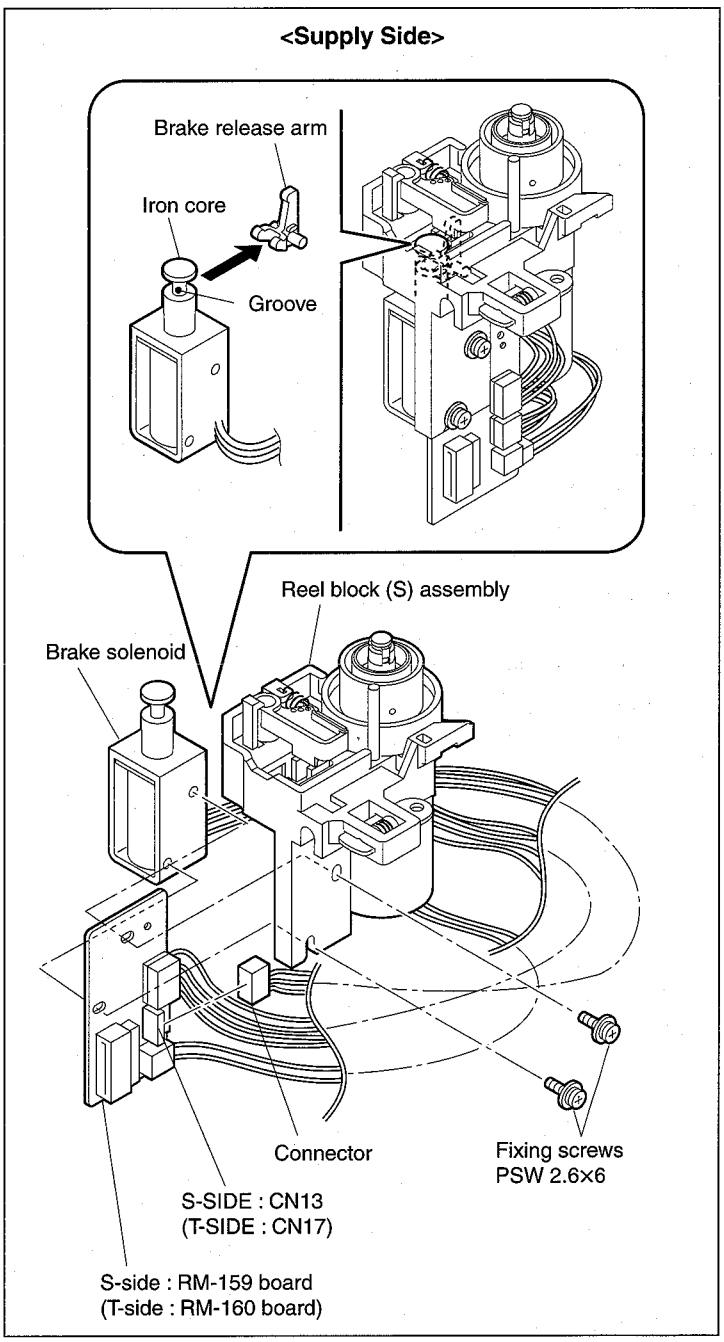
1. Remove the reel block assembly from the machine according to the reel block assembly replacement procedure. (Refer to section 6-6.)
2. Remove the two fixing screws (PSW 2.6×6) securing the brake solenoid to the reel block assembly, and remove the brake solenoid assembly together with either RM-159 board (S side) or RM-160 board (T side).
3. Remove the connector CN13 (S side) on the RM-159 board, or CN17 (T side) on the RM-160 board.

Attachment

4. Insert the groove of the iron core of the new brake solenoid, into the brake release arm, and attach the brake solenoid with two screws temporarily.
5. Attach the disassembled parts by reversing the removal procedure from steps 3 to 1.

Adjustment After Replacement

6. Perform the Reel Brake Release Check and Adjustment. (Refer to section 6-4-3.)



6-9. CAPSTAN MOTOR REPLACEMENT

Tools

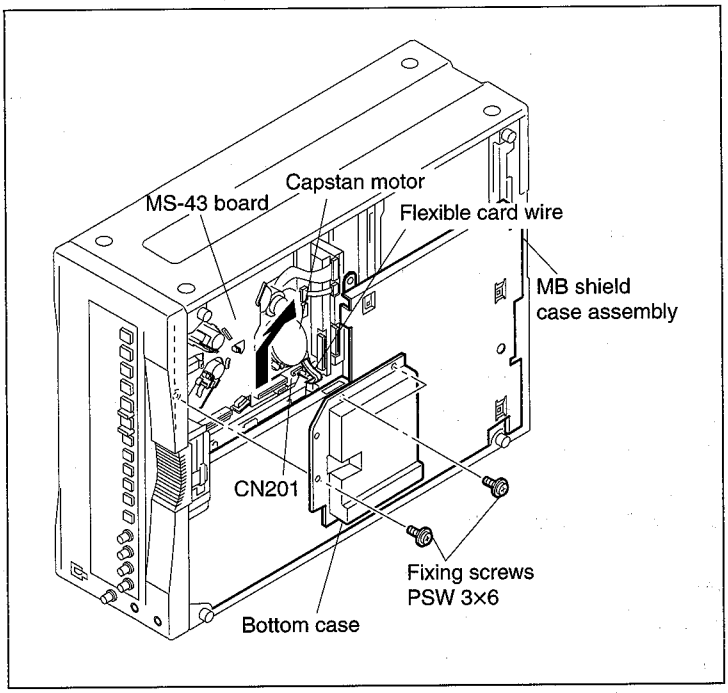
Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01

Removal

1. Place this unit with its left side down.
2. Remove the three fixing screw screws (PWH 3×6) as shown, and remove the bottom case from the MD chassis in the direction of arrow.
3. Remove the flexible card wire of the capstan motor from CN201 of the MS-43 board.
4. While holding the capstan motor from the rear side of the MD chassis with hand, remove the two fixing screws (PWH 2.6×6) as shown from the front side of the chassis assembly, and remove the capstan motor.

   Note 1 : Hold the capstan motor with hand so as not to drop the capstan motor.

   Note 2 : Be careful not to give any scars on the tape guides in the vicinity of the capstan motor.



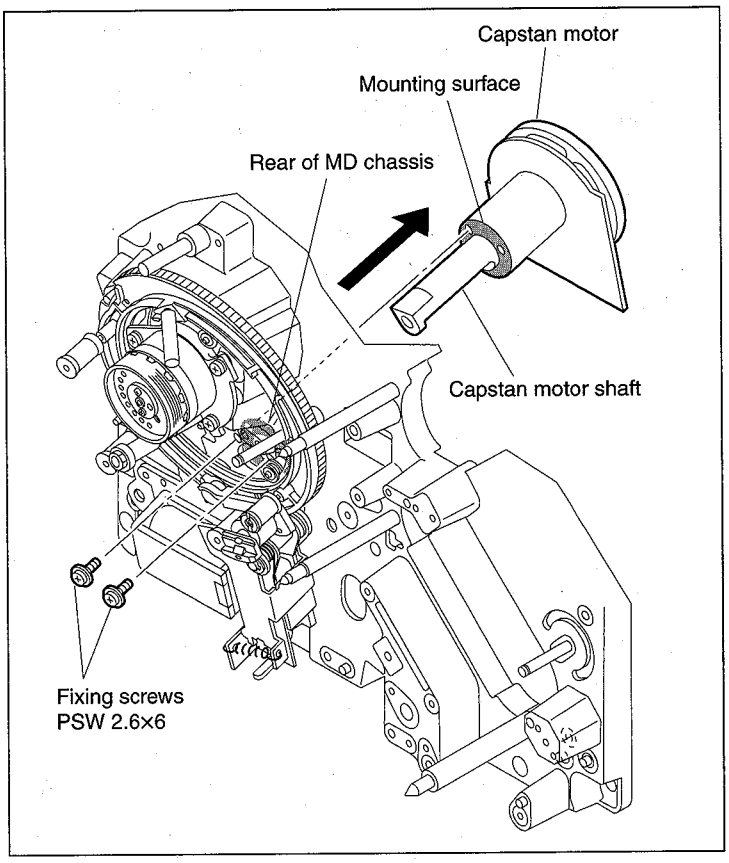
Attachment

5. Clean the mounting surface of the new capstan motor and the mounting surface of the MD chassis with the cleaning cloth moistened with the cleaning fluid.
6. Insert the capstan motor from the rear side of the chassis assembly, and fix it with the two fixing screws from the front side.

   Note 1 : Be careful not to give any scars on the capstan shaft.

   Note 2 : Be careful not to give any scars on the tape guides in the vicinity of the capstan motor.

7. Insert the flexible card wire of the capstan motor to CN201 of the MS-43 board.



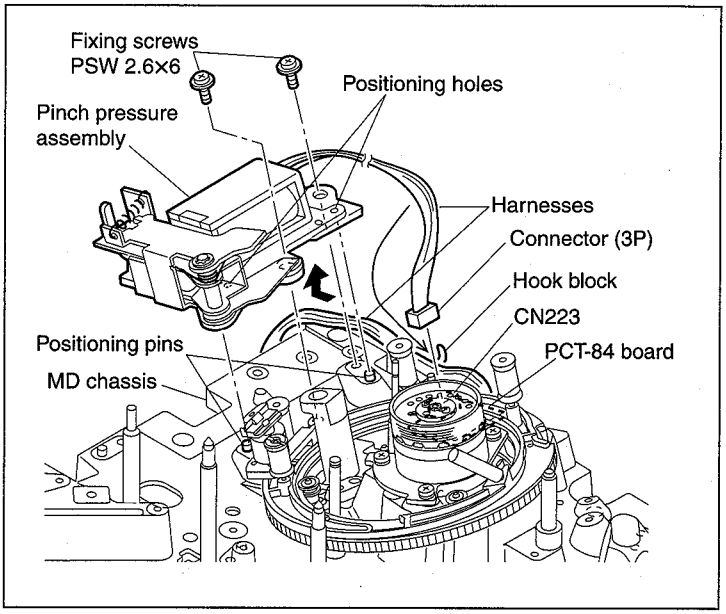
Adjustment After Replacement

- Perform the following adjustments:
  - SW Position Adjustment. (Refer to section 7-6.)
  - AGC Reference Adjustment. (Refer to section 4.)
  - Tape Path Adjustment. (Refer to section 7.)
  - PLL F0 Adjustment. (Refer to section 4.)
  - PLL DELAY Adjustment. (Refer to section 4.)

6-10. PINCH PRESSURE ASSEMBLY REPLACEMENT AND ADJUSTMENT

Removal

1. Remove the connector (3P) CN223 from the PTC-84 board.
2. Remove the two screws (PWH 2.6×6) and remove the pinch pressure assembly in the direction of arrow.



Attachment

3. Insert the positioning pins (at two positions) of the MD chassis into the positioning holes of the new pinch pressure assembly, and fix the pinch pressure assembly with two screws.
4. Insert the connector (3 pins) to CN223 on the PTC-84 board.
5. Route the harness of CN220 and that of the pinch pressure assembly together through the hook of the MD chassis.

Check After Replacement

Mode

Let the mechanism perform threading motion without inserting a cassette, and enter the PLAY mode (in which the pinch is pressed).

6. Confirm that the pinch pressure lever so that the clearance between the pinch pressure lever and the pinch limiter satisfies the specification. (Fig.-1)

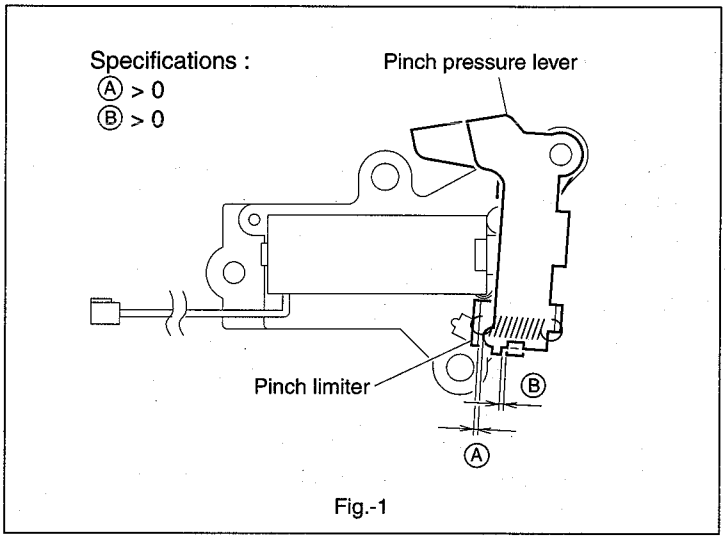


Fig.-1

Adjustment After Replacement

7. Perform the Tape Path Adjustment. (Refer to section 7-2.)

6-11. PINCH SOLENOID REPLACEMENT

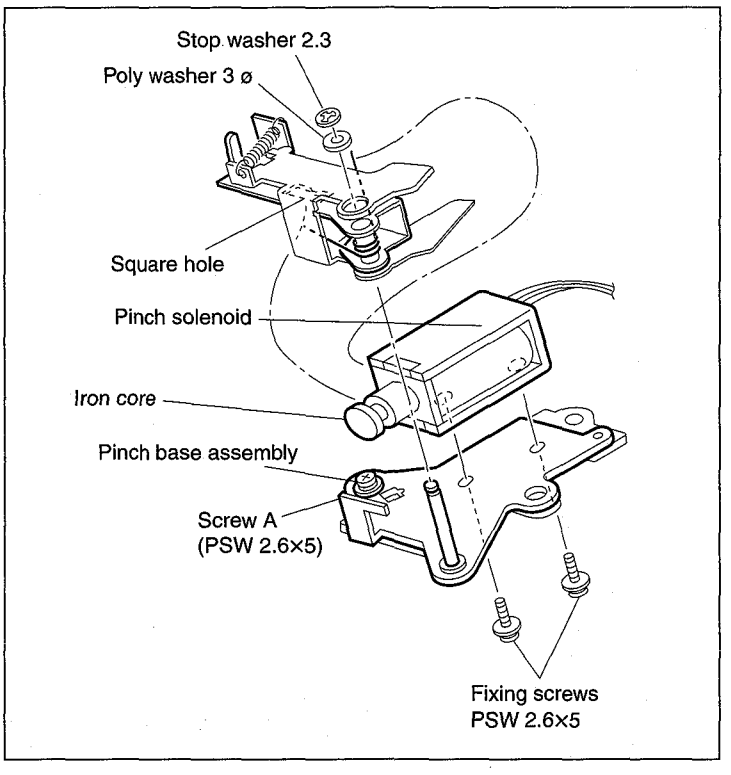
Tools

Clearance gauge : 9-911-053-00

Removal

1. Remove the pinch pressure assembly. (Refer to section 6-10.)
2. Remove the two screws (PSW 2.6×5) fixing the pinch solenoid to the pinch base assembly, and remove the pinch solenoid.

   Note : Because the screw A is coated by screw locking compound (red), do not loosen it.



Attachment

3. Insert the head of iron core of the new pinch solenoid into the square hole of the pinch limiter, and fix the pinch solenoid to the pinch base assembly temporarily. (Fig.-1)

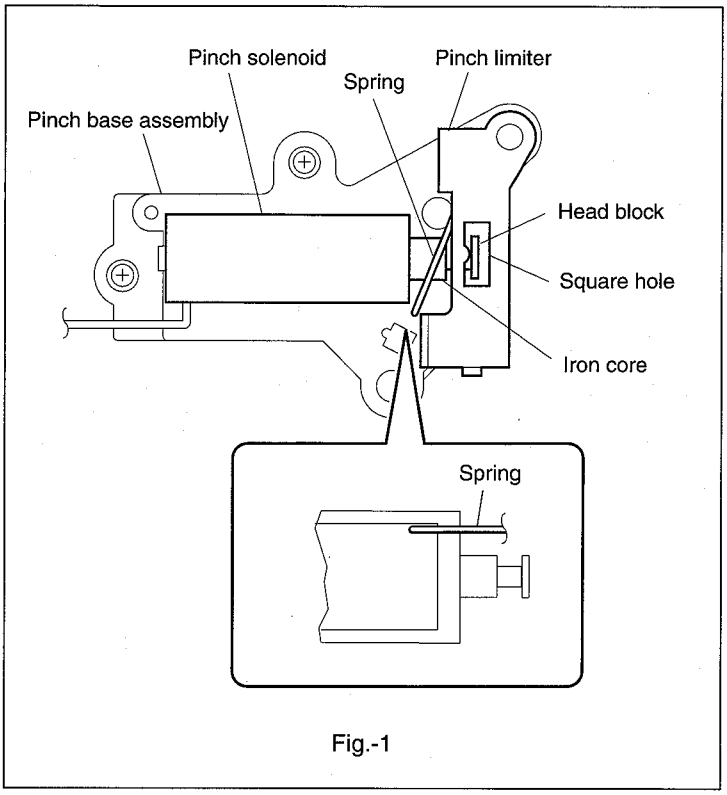
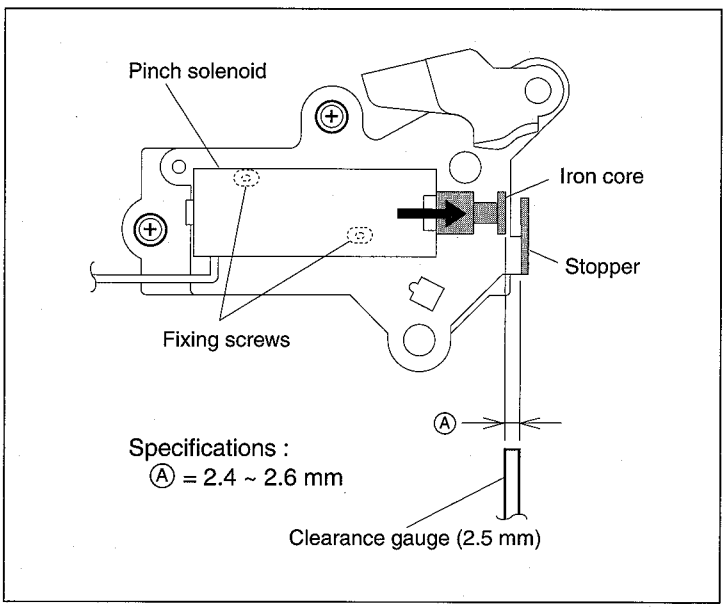


Fig.-1

4. Insert the clearance gauge (2.5 mm) between the solenoid's iron core and the stopper, and slide the pinch solenoid as far it can go. Tighten the two screws. (Fig.-2)
   After tightening the two screws, remove the clearance gauge.
5. Check that the clearance between the iron solenoid core and the stopper satisfies the specification.



Adjustment After Replacement

6. Check position of the pinch pressure assembly. (Refer to section 6-10.)
7. Perform the Tape Path Adjustment. (Refer to section 7-2.)

6-12. GEAR BOX MOTOR REPLACEMENT

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01
Sony grease (SGL-601) : 7-651-000-10

Mode

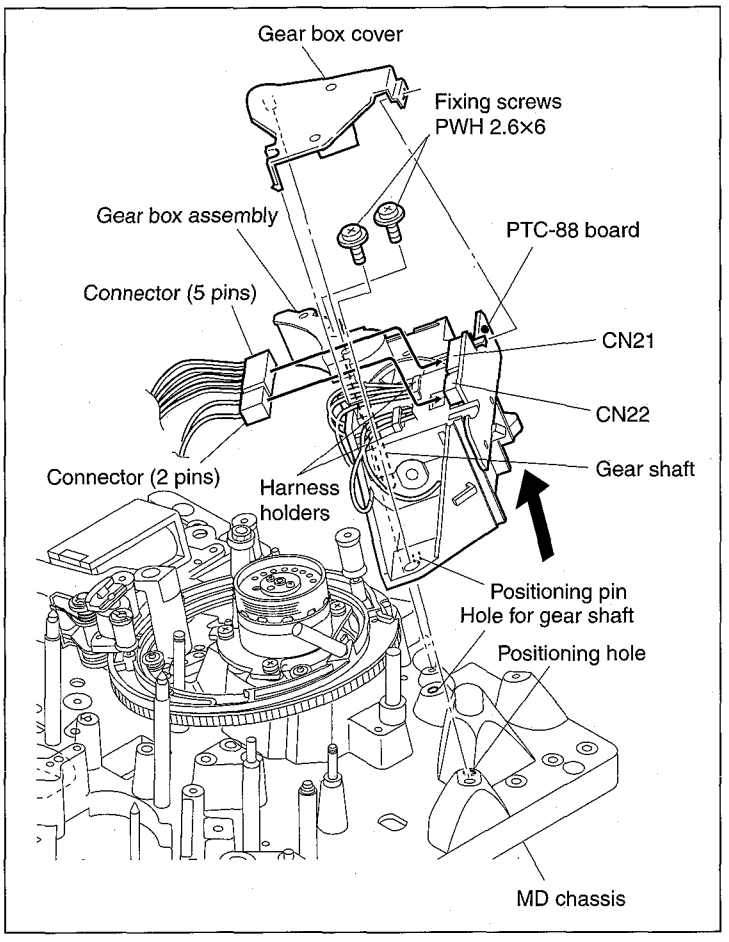
EJECT mode

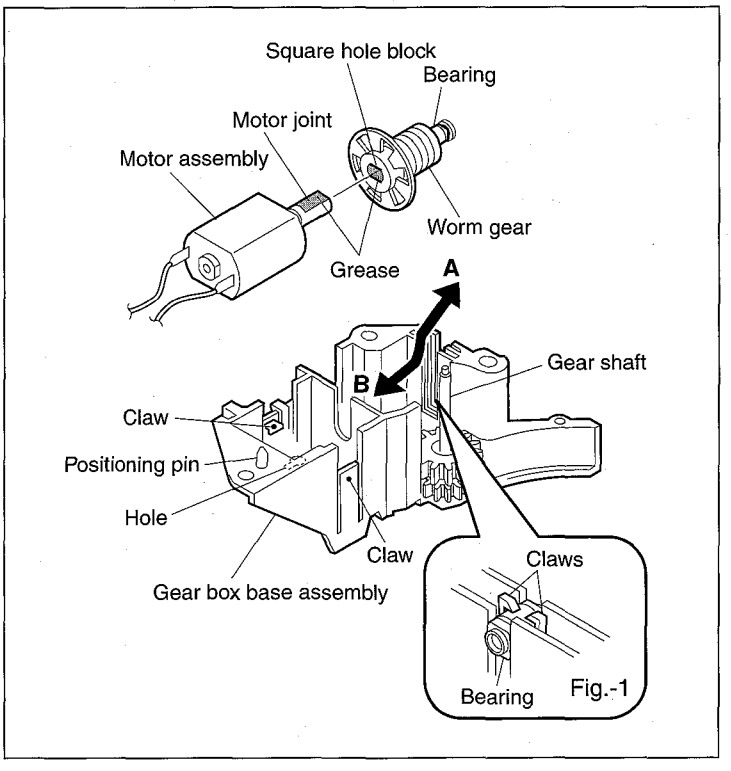
Removal

1. Remove the gear box cover from the gear box assembly.
2. Remove the two connectors (CN21 and CN22) on the PTC-88 board of the gear box assembly.
   Note : Be careful not to break the harness holders.
3. Remove the two screws (PWH 2.6×6) fixing the gear box assembly to the MD chassis, and remove the gear box assembly.
4. Let the motor assembly protrude from the hole of the gear box base assembly, and remove the gear box assembly in the angled direction of arrow **A**.
5. Remove the motor assembly from the worm gear block.

Attachment

6. Clean the motor joint of the new motor assembly with a cleaning cloth moistened with cleaning fluid.
7. Coat the motor joint of the new motor assembly and the square hole of the worm gear with grease.
8. Insert the motor joint into the square hole of the worm gear.
9. While taking care not to drop the PTC-88 board, push in the motor assembly from the direction of the arrow **B** until the gear box motor assembly is locked by the two claws of the gear box base assembly.
   At this time, push in the bearing block simultaneously until the bearing block is locked by the two claws. (Fig.-1)
10. Insert the positioning pins of the gear box assembly and the gear shaft into the holes (two holes) of the MD chassis.
11. Attach the disassembled parts by reversing the removal procedure from steps 3 to 1.





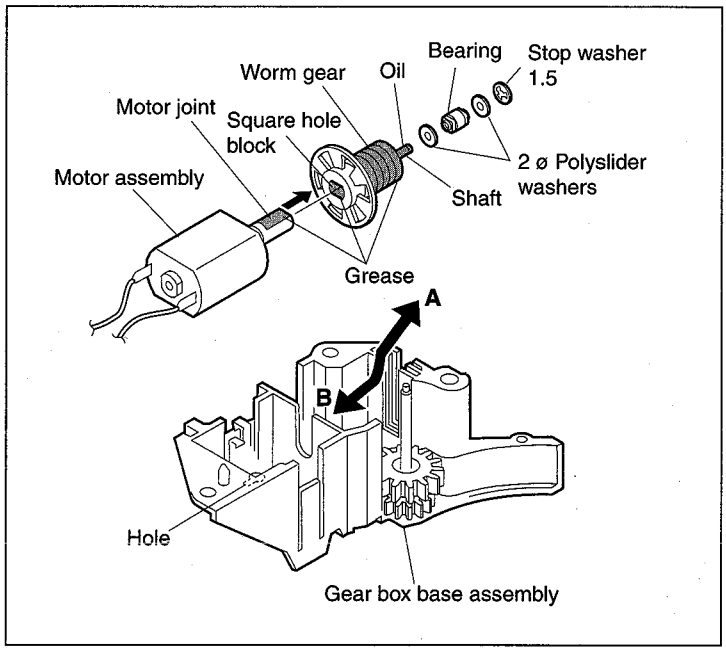
6-13. WORM GEAR REPLACEMENT (GEAR BOX)

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01
Sony grease (SGL-601) : 7-651-000-10
Sony oil (NT-68) : 7-661-018-18

Removal

1. Remove the gear box assembly. (Refer to section 6-12.)
2. Let the motor assembly protrude from the hole of the gear box base assembly, and remove the gear box assembly in the angled direction of arrow **A**.
3. Remove the worm gear by pulling it from the motor assembly in the direction of arrow.
4. Remove the stop washer 1.5 from the worm gear, and remove the bearing and 2 ø polyslider washers (2 pieces).

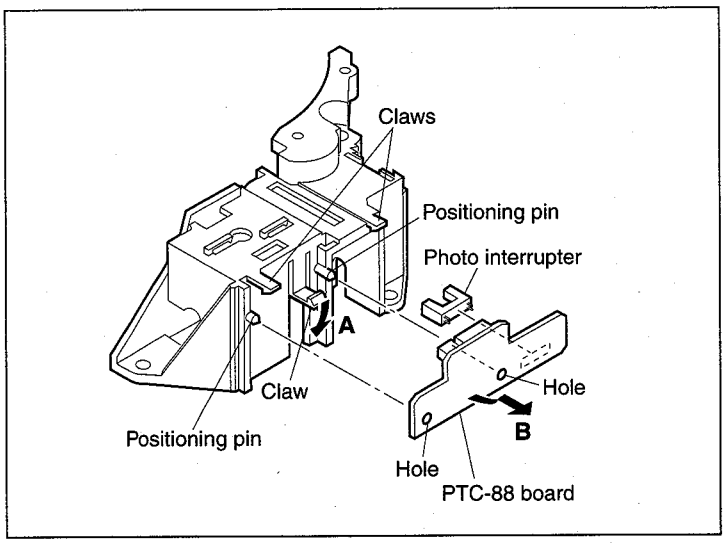


Attachment

5. Clean the shaft of the new worm gear with the cleaning cloth moistened with cleaning liquid.
6. Apply a drop of oil to the shaft of the worm gear as shown. Insert the shaft of the worm gear through the two pieces of 2 ø polyslider washer and the bearing, and fix them with a stop washer.
7. Coat thin the worm gear, square hole and the motor joint with grease.
8. Insert the motor joint to the square hole of the worm gear.
9. Push in the motor assembly from the direction of arrow **B** until the motor assembly is locked by the two claws of the gear box base assembly.
10. Attach the gear box assembly to the gear box base assembly referring to section 6-12.

6-14. GEAR BOX MOTOR ROTATION SENSOR REPLACEMENT

Note : Be careful not bend the top two claws of the gear box assembly when attaching and removing the PTC-88 board. (This prevents the two claws from breakage.)



Removal

1. Remove the gear box assembly. (Refer to section 6-12.)
2. Release the claw of the gear box assembly securing the PTC-88 board in the direction of affow **A**, and remove the PTC-88 board in the direction of arrow **B**.
3. Remove the photo interrupter which is connected to the PTC-88 board by soldering.

Attachment

4. Attach the new photo interrupter to the PTC-88 board by soldering.
5. Align the holes of the PTC-88 board with the two positioning pins of the gear box assembly, and push in the PTC-88 board until it is engaged with the three claws.
6. Attach the gear box assembly referring to section 6-12.

6-15. PINCH ROLLER ARM ASSEMBLY REPLACEMENT

Removal

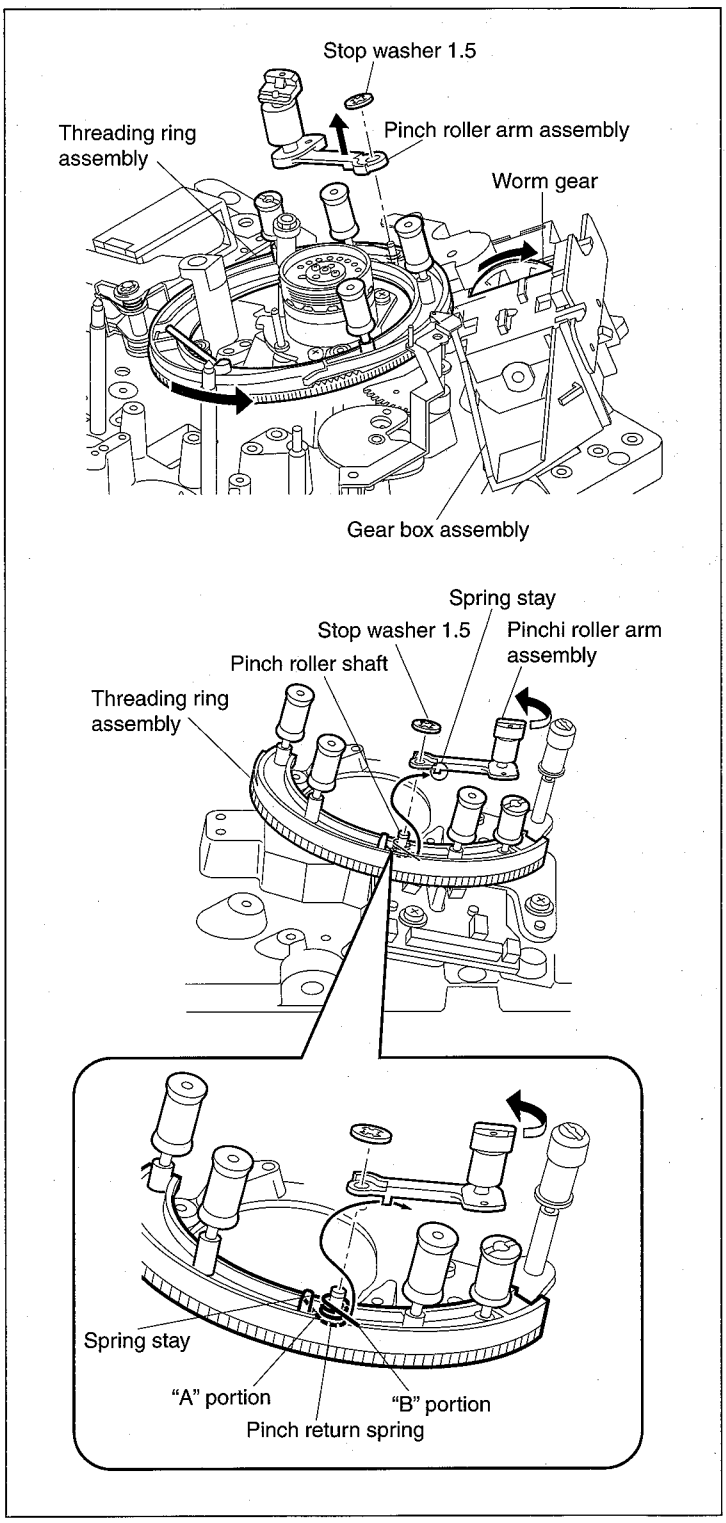
1. Revolve the worm gear of the gear box assembly with hand in the direction of arrow until the pinch roller arm assembly comes to the position as shown.
2. Remove the stop washer 1.5 from the pinch roller arm assembly.
3. While pressing the pinch return spring with hand, remove the pinch arm assembly from the pinch roller shaft.

Attachment

4. Hook the "A" portion of the pinch return spring on the spring stay of the threading ring assembly.
5. Insert the new pinch roller arm assembly through the pinch roller shaft and the spring. Fix them using the stop washer 1.5.
6. Hook the "B" portion on the spring stay of the pinch roller arm assembly.
7. Confirm that the pinch roller arm assembly returns smoothly to the original position when the pinch roller arm assembly is moved in the direction of arrow by hand then the hand is removed.

Adjustment After Replacement

8. Perform the Tape Path Adjustment. (Refer to section 7-2.)



6-16. PRECEDING ROLLER (TG-7) ASSEMBLY REPLACEMENT

Tools

Tape guide adjustment driver : J-6440-850-A
Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01

Removal

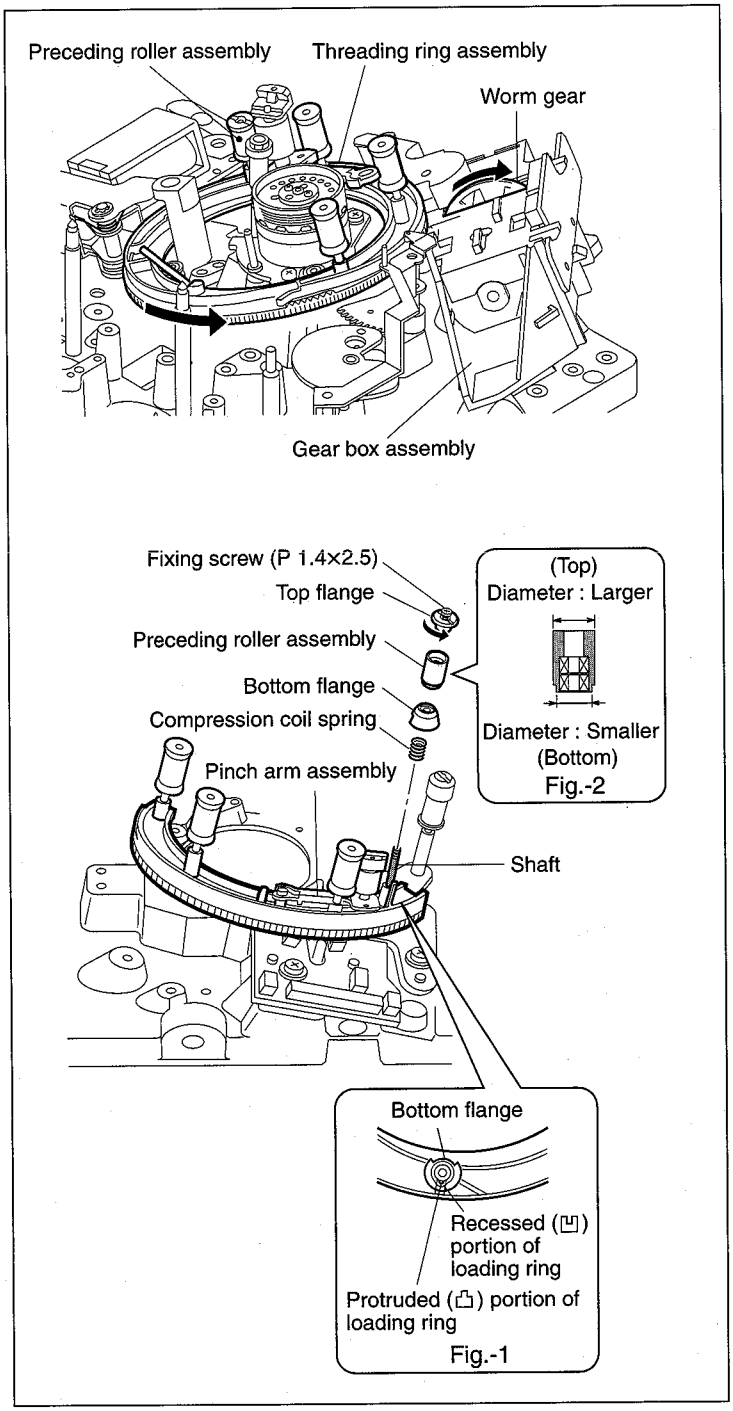
1. Revolve the worm gear of the gear box assembly with hand in the direction of arrow until the preceding roller assembly comes to the position as shown.
2. Revolve the top flange in the direction of arrow, and remove the top flange.
   Note : Do not revolve the fixing screws which are painted by screw locking compound.
3. Remove the preceding roller assembly.
4. Remove the bottom flange and the compression coil spring.

Attachment

5. Clean the outer circumference of the shaft of the threading ring assembly with the cleaning cloth moistened with the cleaning fluid.
6. Insert the compression coil spring into the shaft. While aligning the recessed part of the bottom flange with the protruded portion on the threading ring, insert the bottom flange. (Fig.-1)
7. Inert the new preceding roller assembly into the shaft in the direction as shown. (Fig.-2)
8. Attach the top flange.

Adjustment After Replacement

9. Perform the Tape Path Adjustment. (Refer to section 7-2.)



6-17. THREADING RING ASSEMBLY REPLACEMENT

Note : When attaching/removing of threading ring assembly, be careful not to touch the peripheral tape guides, drum and capstan shaft.

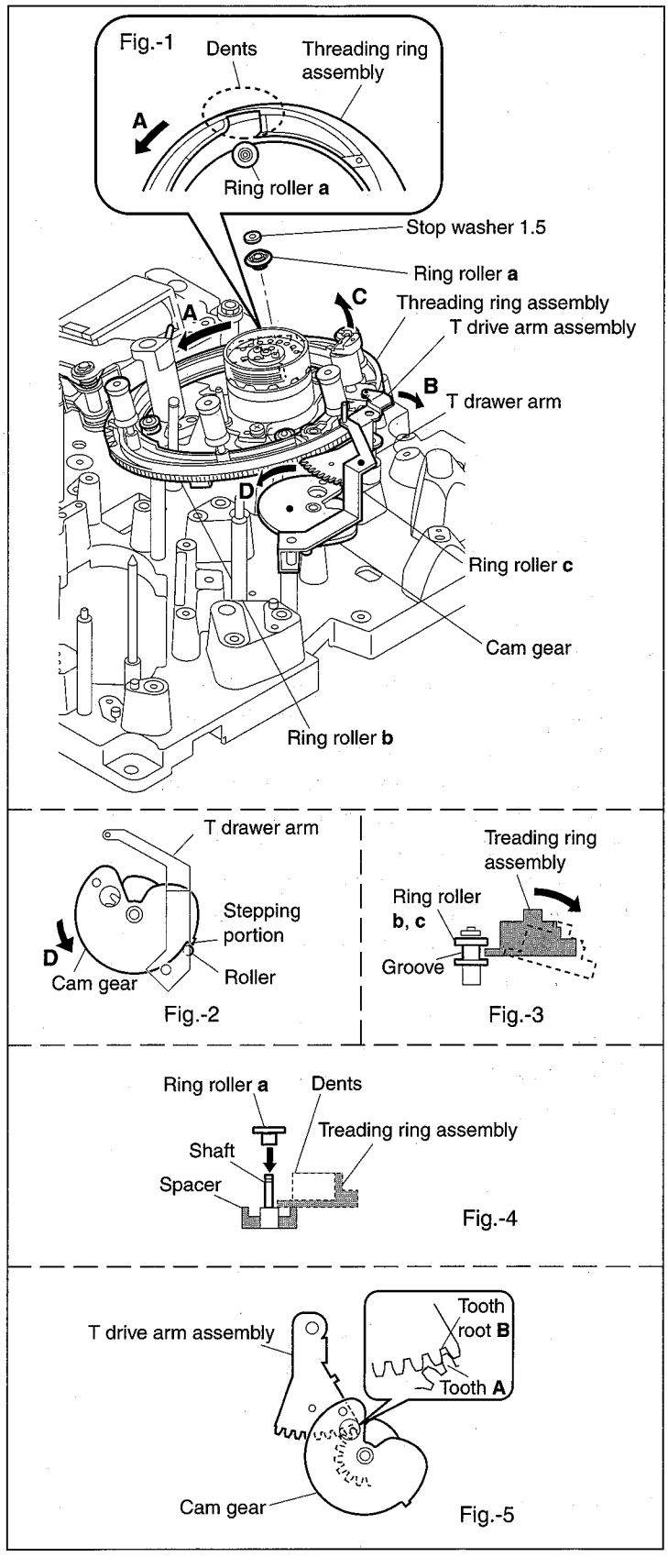
Removal

1. Remove the gear box assembly. (Refer to section 6-12.)
2. Remove the S arm assembly. (Refer to section 6-23.)
3. Turn the threading ring with hand in the direction of arrow **A** until the recessed portion comes to "**a**" position of the ring roller. (Fig.-1)
4. Revolve the cam gear in the direction of arrow **D** by hand until the roller block of the T drawer arm is locked with the stepped portion of the cam gear. (Fig.-2)
5. Remove the stop washer 1.5, and remove the ring roller "**a**".
6. While pressing the T drive arm assembly in the direction of arrow **B**, remove the threading ring assembly from the grooves of the ring rollers "**b**" and "**c**", lift the threading ring up in the direction of arrow **C** to remove it. (Fig.-3)

   Note : At this time, the T drawer arm could go out of the joint of the T drive arm assembly and return to the EJECT position.

Attachment

7. Revolve the cam gear in the direction of arrow **D** with hand until the roller block of the T drawer arm is locked with the stepped portion of the cam gear. (Fig.-2)
8. Hold the new threading ring assembly in the angled posture. While pushing the T drive arm assembly in the direction of arrow **B** as shown, insert the new threading roller into the grooves of the ring rollers "**b**" and "**c**". (Fig.-3)
9. While the threading ring assembly is placed on top of the spacer, insert the new ring roller "**a**" into the shaft. (Fig.-4)
10. Attach the stop washer 1.5 to the ring roller "**a**".
11. Unlock the roller of the T drawer arm.
12. Confirm that the cam gears of the T drive arm assembly engage correctly with that of the T drawer arm, i.e., the tooth A of the cam gear should engage with the tooth root B of the T drive arm assembly. (Fig.-5)
13. Attach the S arm assembly. (Refer to section 6-23.)
14. Confirm that the S arm assembly and the T drawer arm work correctly when the threading ring assembly is turned with hand.
15. Attach the gear box assembly. (Refer to section 6-12.)



6-18. RING ROLLER REPLACEMENT

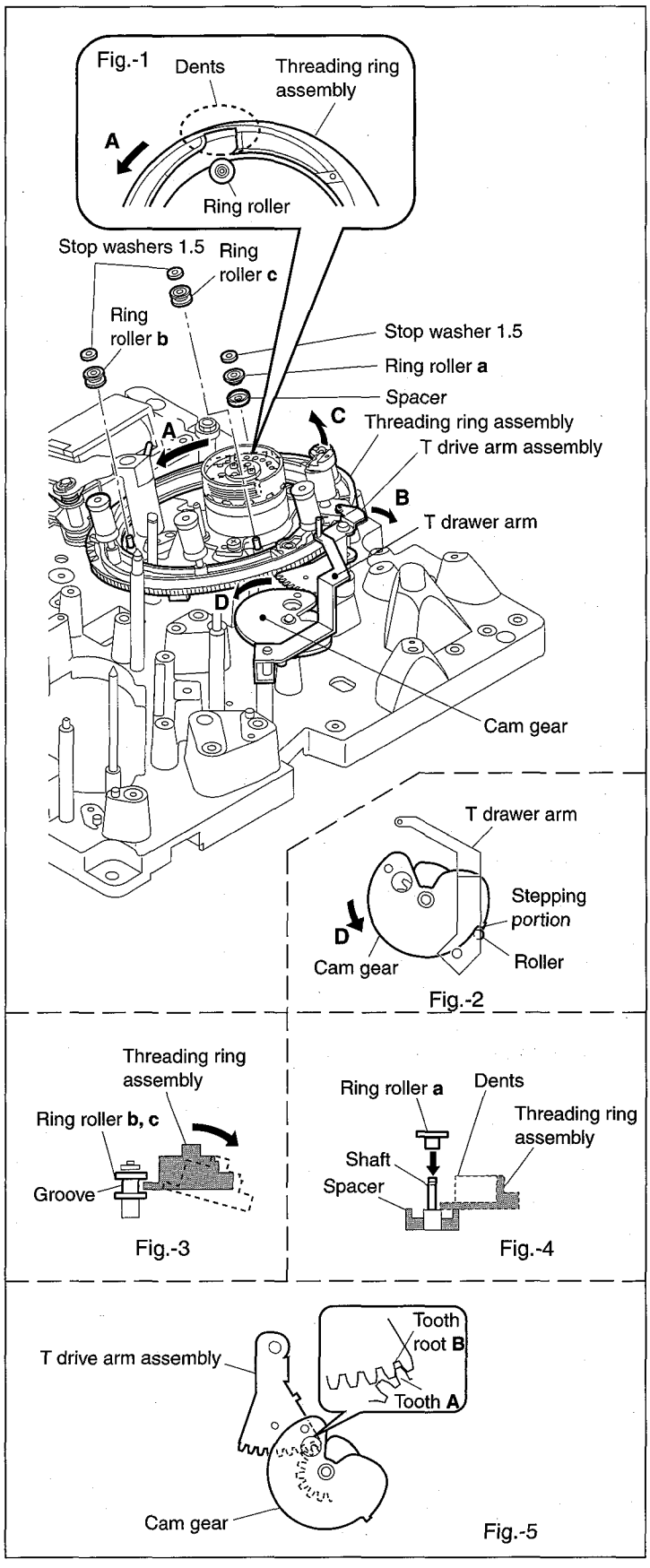
Note : When attaching/removing of threading ring assembly, be careful not to touch the peripheral tape guides, drum and capstan shaft.

Removal

1. Remove the gear box assembly. (Refer to section 6-12.)
2. Remove the S arm assembly. (Refer to section 6-23.)
3. Revolve the threading ring with hand in the direction of arrow **A** until the recessed portion comes to "**a**" position of the ring roller. (Fig.-1)
4. Revolve the cam gear in the direction of arrow **D** by hand until the roller block of the T drawer arm is locked with the stepped portion of the cam gear. (Fig.-2)
5. Remove the stop washer 1.5, and remove the ring roller "**a**".
6. While pressing the T drive arm assembly in the direction of arrow **B**, remove the threading ring assembly from the grooves of the ring rollers "**b**" and "**c**". (Fig.-3)
7. Remove the spacer.
8. Remove the two stop washers 1.5 from the ring roller "**b**" and "**c**", and remove the ring roller.

Attachment

9. Put the new ring rollers **"b"** and **"c"** through the shafts of threading ring, attach the two stop washers 1.5 to them.
10. Attach a new spacer. (Fig.-4)
11. Assemble the parts by reversing the removal procedure of step 6.
12. While the threading ring assembly is placed on top of the spacer, insert the new ring roller a into the shaft. (Fig.-4)
13. Attach the stop washer 1.5 to the ring roller "**a**".
14. Unlock the roller of the T drawer arm.
15. Confirm that the cam gears of the T drive arm assembly engage correctly with that of the T drawer arm, i.e., the tooth A of the cam gear should engage with the tooth root B of the T drive arm assembly. (Fig.-5)
16. Attach the S arm assembly. (Refer to section 6-23.)
17. Confirm that the S arm assembly and the T drawer arm work correctly when the threading ring assembly is turned with hand.
18. Attach the gear box assembly. (Refer to section 6-12.)



6-19. RING POSITION SENSOR REPLACEMENT

Mode

EJECT mode

Removal

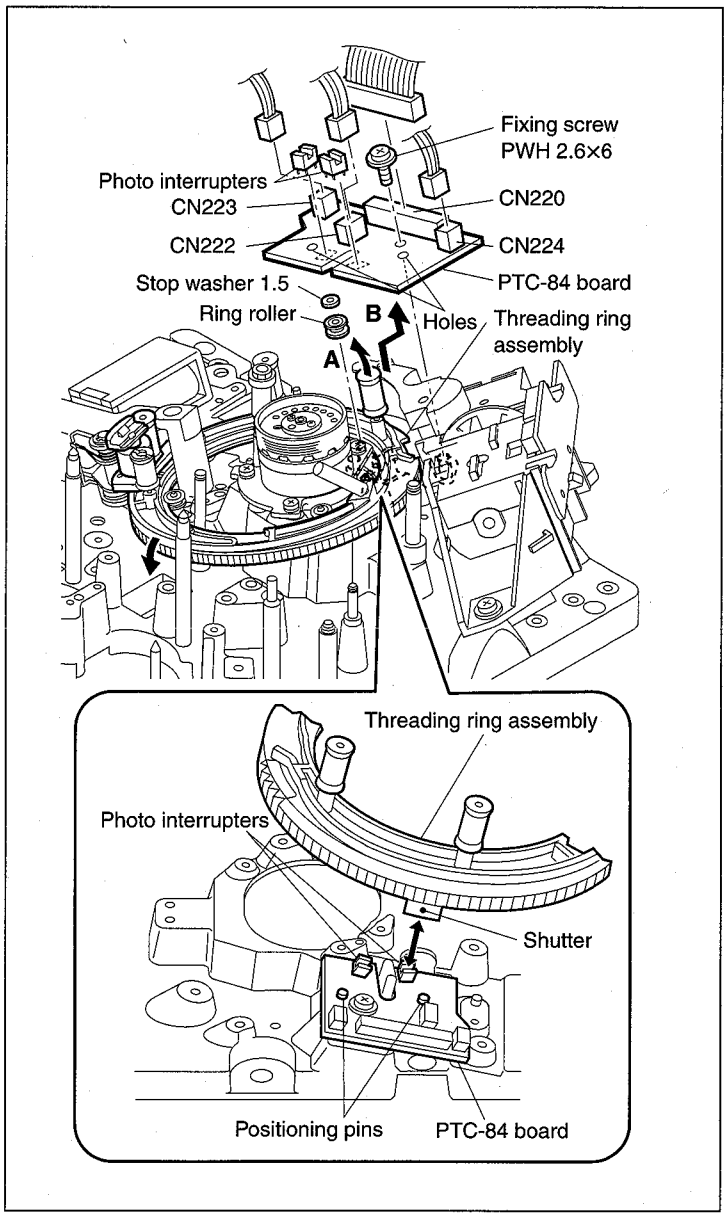
1. Remove the gear box assembly. (Refer to section 6-12.)
2. Remove the S arm assembly. (Refer to section 6-23.)
3. Remove the ring rollers and the threading ring assembly. (Refer to section 6-17.)
4. Remove the four connectors (CN220, CN222 to CN224) on the PTC-84 board.
5. Remove the fixing screw (PWH 2.6×6) on the PTC-84 board.
6. While lifting up the threading ring in the direction of arrow **A** so that the shutter of the threading ring is not caught by the PTC-84 board, remove the PTC-84 board in the direction of the arrow **B**.
7. Remove the photo interrupter soldered on the PTC-84 board.

Attachment

8. Connect the new photo interrupter to the PTC-84 board by soldering.
9. Align the holes of the PTC-84 board with the positioning pins of the MD chassis (at two positions), and fix the PTC-84 board with the screw.
10. Attach the disassembled parts by reversing the removal procedure from steps 4 to 1.

Adjustment After Replacement

11. Check the ring position sensor for correct operation. (Refer to section 4.)



6-20. RS MOTOR ASSEMBLY REPLACEMENT

Removal

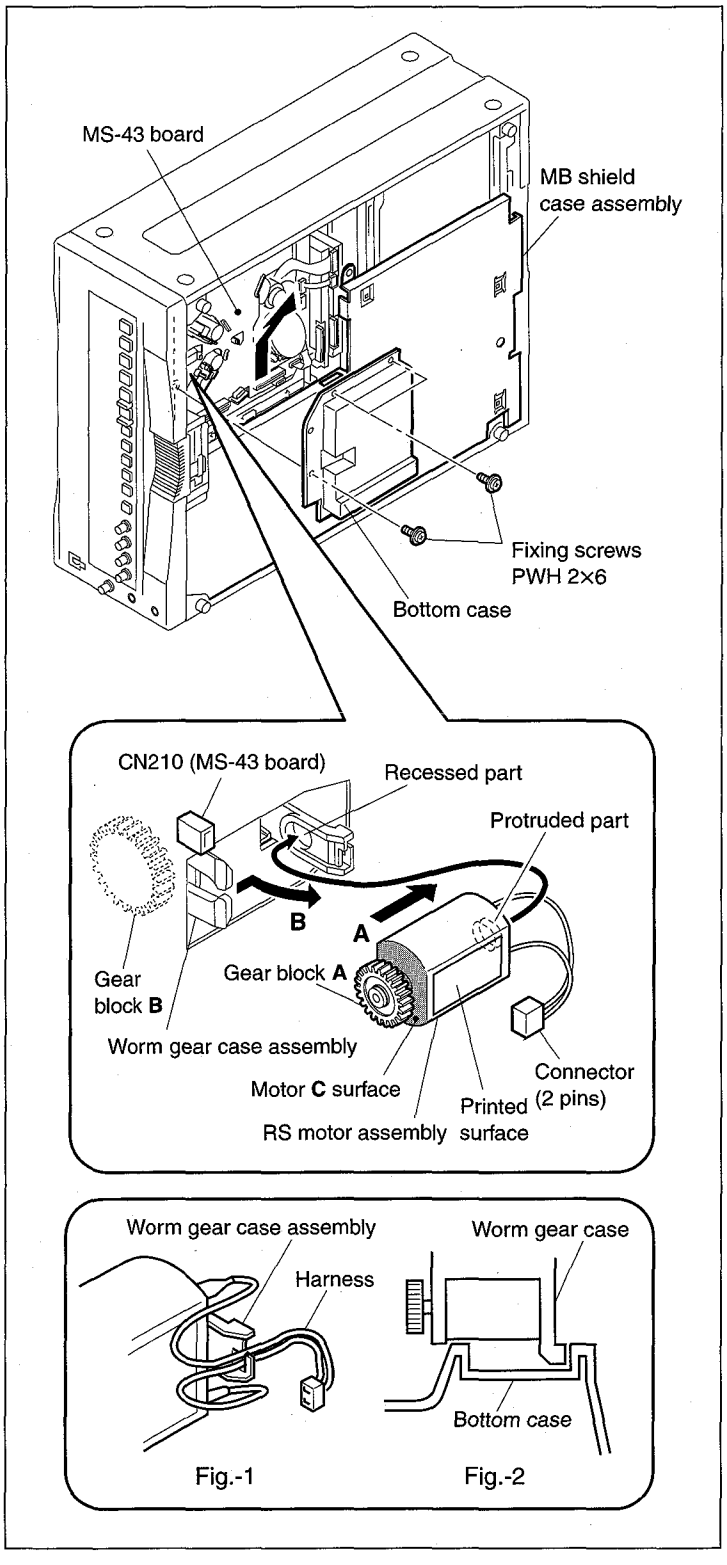
1. Place this unit with its left side down.
2. Remove the three screws (PWH 3×6) fixing the bottom case to the MD chassis, remove the bottom case in the direction of arrow.
3. Remove the connector (CN210) on the MS-43 board.
4. While pulling the RS motor assembly in the direction of arrow **A** remove the gear block in the direction of arrow **B**.

Attachment

5. Insert the new RS motor assembly in the direction as shown, and insert the protruded part into the recessed part of the worm gear case assembly. Attach the new RS motor assembly so that the gear block "**A**" is engaged with the gear "**B**" block.

Note : Confirm that the "C" surface of the motor is contacted to worm gear case assembly tight.

6. Pass the harness through the worm gear case assembly and connect the 2-pin connector to the MS-43 board (CN210). (Fig.-1)
7. Attach the bottom case to MD chassis with three fixing screws as shown by Fig.-2.



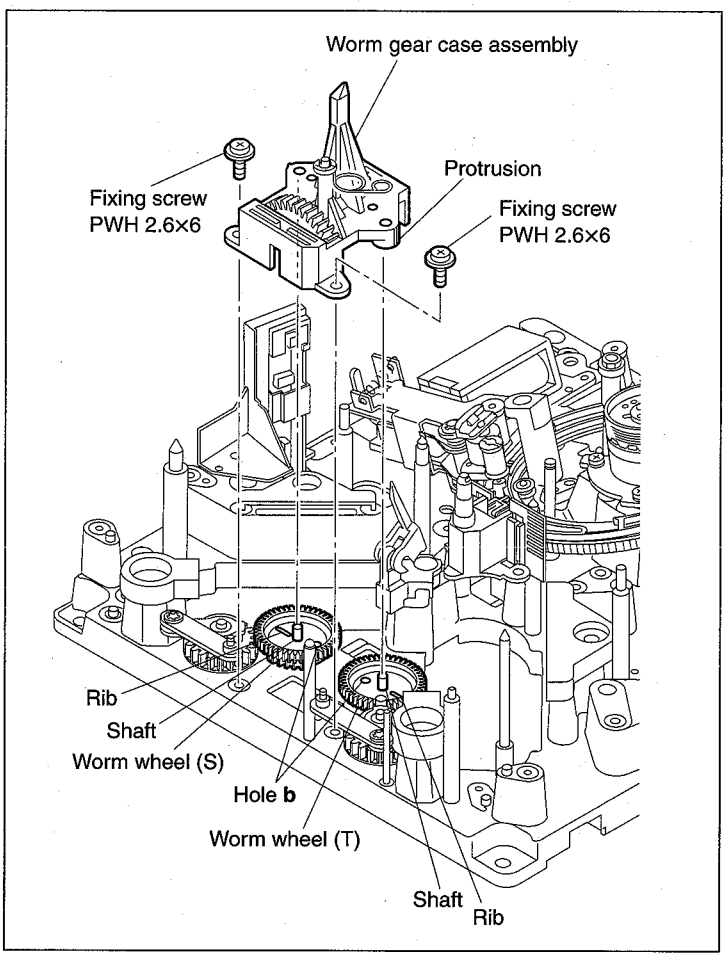
6-21. WORM GEAR (REEL SHIFT) REPLACEMENT

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01
Sony grease (SGL-601) : 7-651-000-10
Sony oil (NT-68) : 7-661-018-18

Removal

1. Remove the cassette memory terminal assembly. (Refer to section 6-28.)
2. Remove the reel block assembly. (Refer to section 6-6.)
3. Remove the RS motor assembly. (Refer to section 6-20.)
4. Place the unit horizontally.
5. Remove the two screws (PWH 2.6×6) fixing the worm gear case assembly, and remove it.



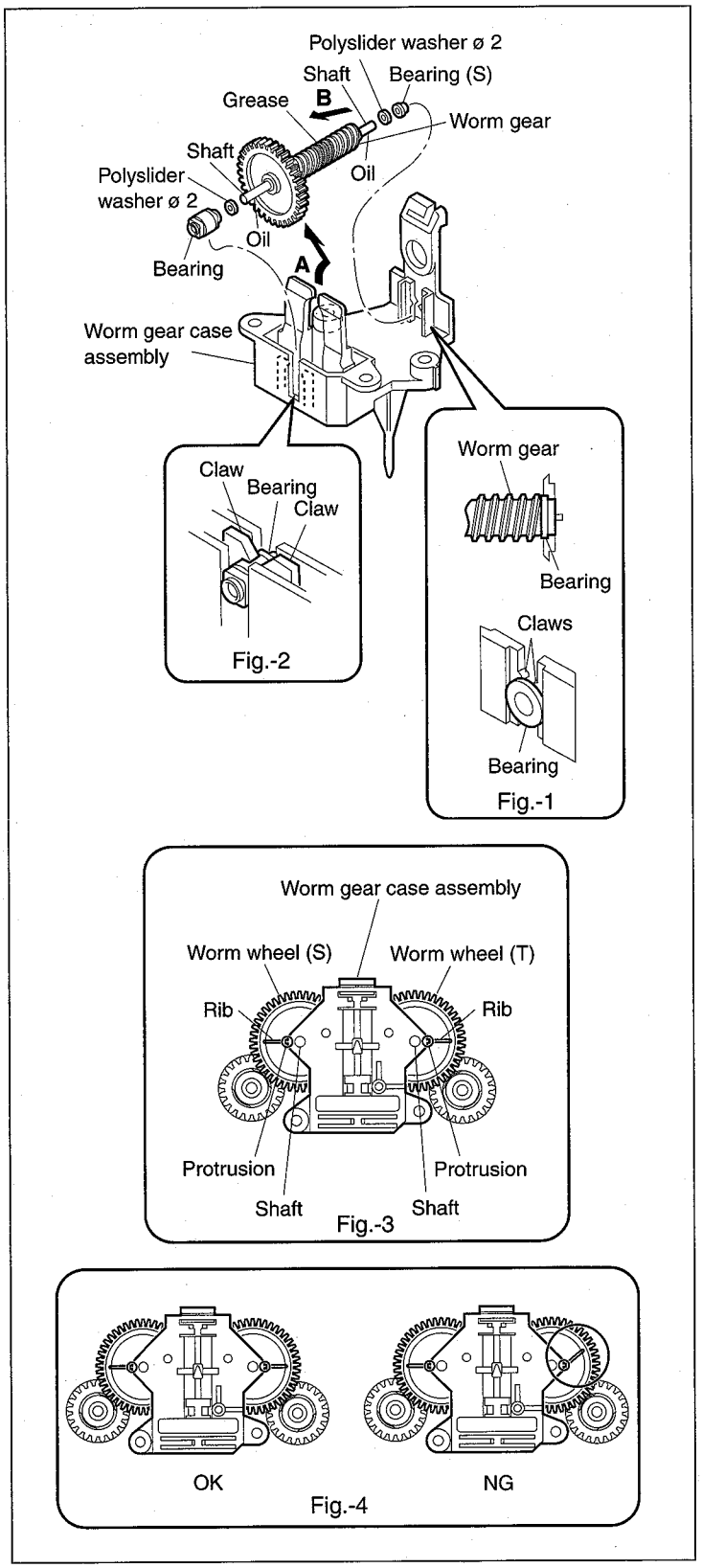
6. Remove the worm gear by pulling it out in the order shown by arrows **A** and **B** from the worm gear case assembly.
7. Remove the bearing, the bearing (S) and the two polyslider washers from the worm gear.

Attachment

8. Clean the new shaft of worm gear with the cleaning cloth moistened with cleaning fluid.
9. Apply a drop of oil to the shaft of the worm gear, attach the bearing, the bearing (S) and the two polyslider washers to the shaft. Attach the assembled new worm gear shaft into the worm gear case assembly until they are set as shown in Fig.-1 and Fig.-2.
10. Coat then the area of 1 to 2 cm long in the center of the worm gear with the grease.
11. Put the worm wheels (S) and (T) to the shaft and align the protrusions of the worm gear case assembly to each rib, and attach the worm gear case assembly. (Fig.-3)
12. Attach the disassembled parts by reversing the removal procedure from steps 5 to 1.

Adjustment After Replacement

13. Confirm that the worm wheel (S) and worm wheel (T) are aligned with each protrusion of worm gear case assembly. (Fig.-4)



6-22. REEL POSITION SENSOR REPLACEMENT

Mode

PLAY state

Removal

1. Loosen the screw fixings the end sensor and the top sensor by rotating it 1 to 2 turns respectively.
2. Release the lock by opening the two claws of the LED holder of the LED assembly, press them down. At this time, the connector on the PTC-87 board is removed from CN207 on the MS-43 board. (Fig.-1)

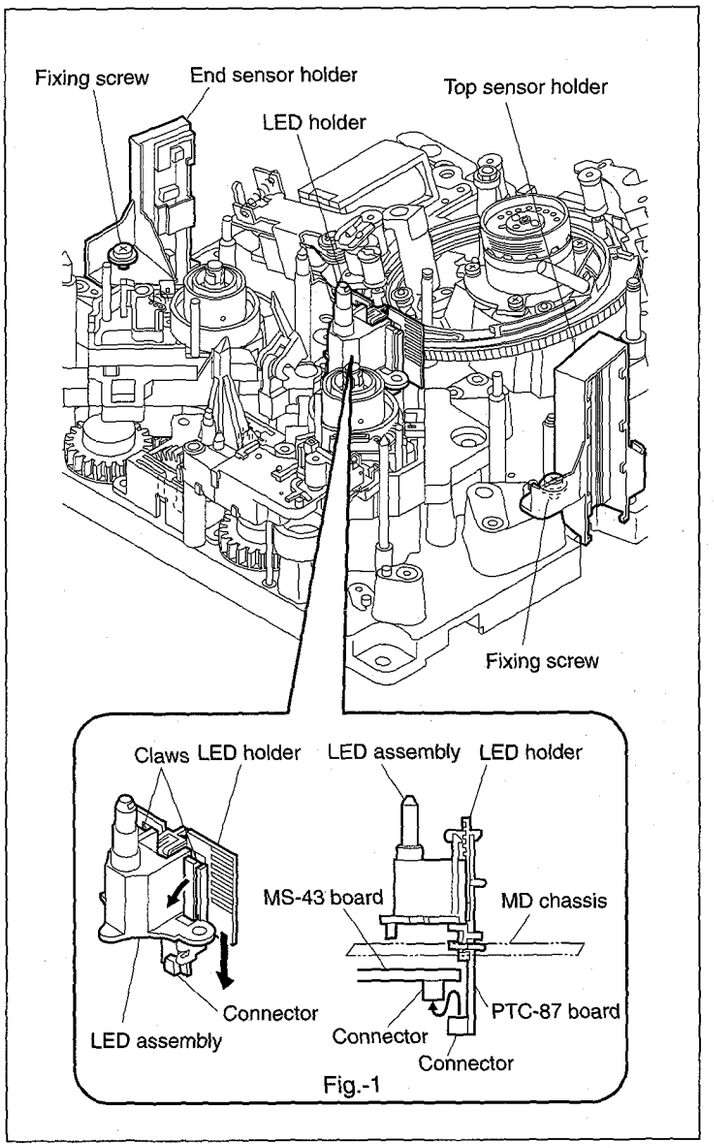
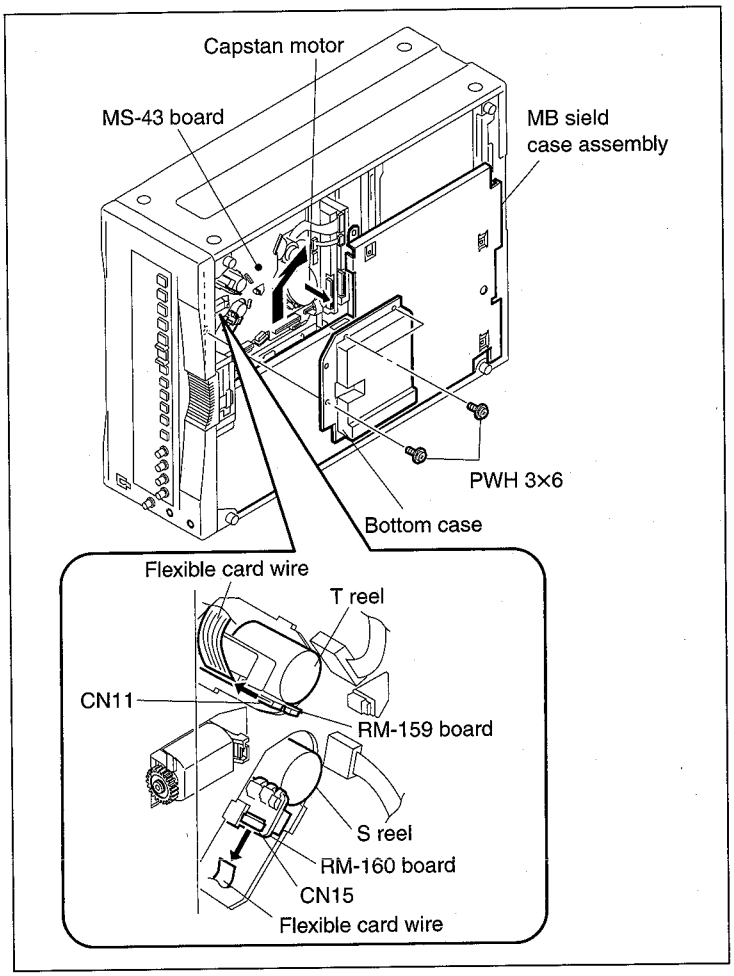


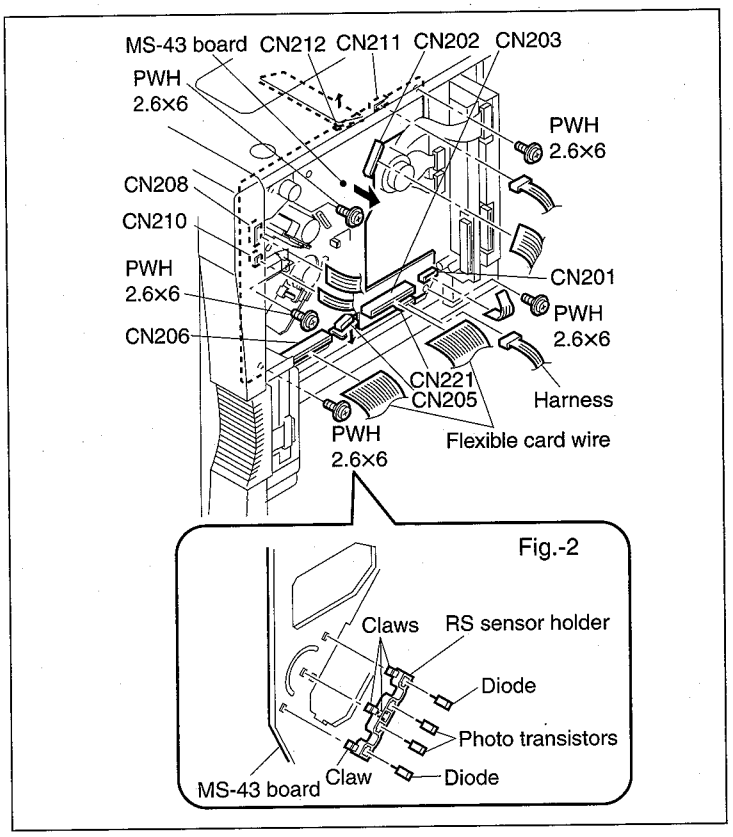
Fig.-1

3. Place this unit with its left side down.
4. Remove the three screws (PWH 3×6) fixing the bottom case to the MD chassis, and remove the bottom case in the direction of arrow.
5. Remove the capstan motor.
   (Refer to section 6-9.)
6. Remove the flexible card wire (CN11 on the RM-159 board in the case of S side, or CN15 on the RM-160 board in the case of T side) which is connected to the reel block.
7. Remove the two flexible card wires (CN203, CN206) which are connected to the MS-43 board.
8. Remove the three flexible card wires (CN201, CN202, CN208) and three harnesses (CN210, CN211, CN221) which are connected to the MS-43 board.
9. Remove the connectors of the top sensor holder and the end sensor holder from CN212 and CN205 on the MS-43 board.
10. Remove the five screws (PWH 2.6×6) fixing the MS-43 board to the MD chassis, and remove the MS-43 board.
11. Remove soldering of the two diodes and two photo transistors on the MS-43 board. Release the four claws of the RS sensor holder. Remove them altogether.
12. Remove the two diodes and two photo transistors from the holders respectively. (Fig.-2)

Attachment

13. Insert the four claws of the RS sensor holders into the holes of the MS-43 board.
14. Insert the new diodes and new photo transistors into the holders respectively and solder them on the MS-43 board.
15. Attach the disassembled parts by reversing the removal procedure from steps 10 to 1.





6-23. S ARM ASSEMBLY REPLACEMENT

Mode

EJECT mode

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01
Sony grease (SGL-601) : 7-651-000-10

Removal

1. Remove the connector (CN31) of the S arm assembly.
   Note : Do not apply force to the arm block of the S arm assembly.
2. Remove the two screws (PWH 2.6×6) securing the S arm assembly to the MD chassis, and remove the S arm assembly.

Attachment

3. Coat the gear block of the new S arm assembly with grease, and align the gear block with the mark of the S drawer gear. Align the shaft and two holes "**a**" of the new S arm assembly with the hole "**b**"and the positioning pins of the MD chassis. Fix the S arm assembly with two screws. (Fig.-1)
4. Connect the 5-pin connector of the end sensor to CN31 of the S arm assembly.
5. Clean the three tape guides with the cleaning cloth moistened with the cleaning fluid.

Adjustment After Replacement

6. Perform the FWD/REV Back Tension Adjustment.
7. Perform the Tape Path Adjustment. (Refer to section 7-2.)

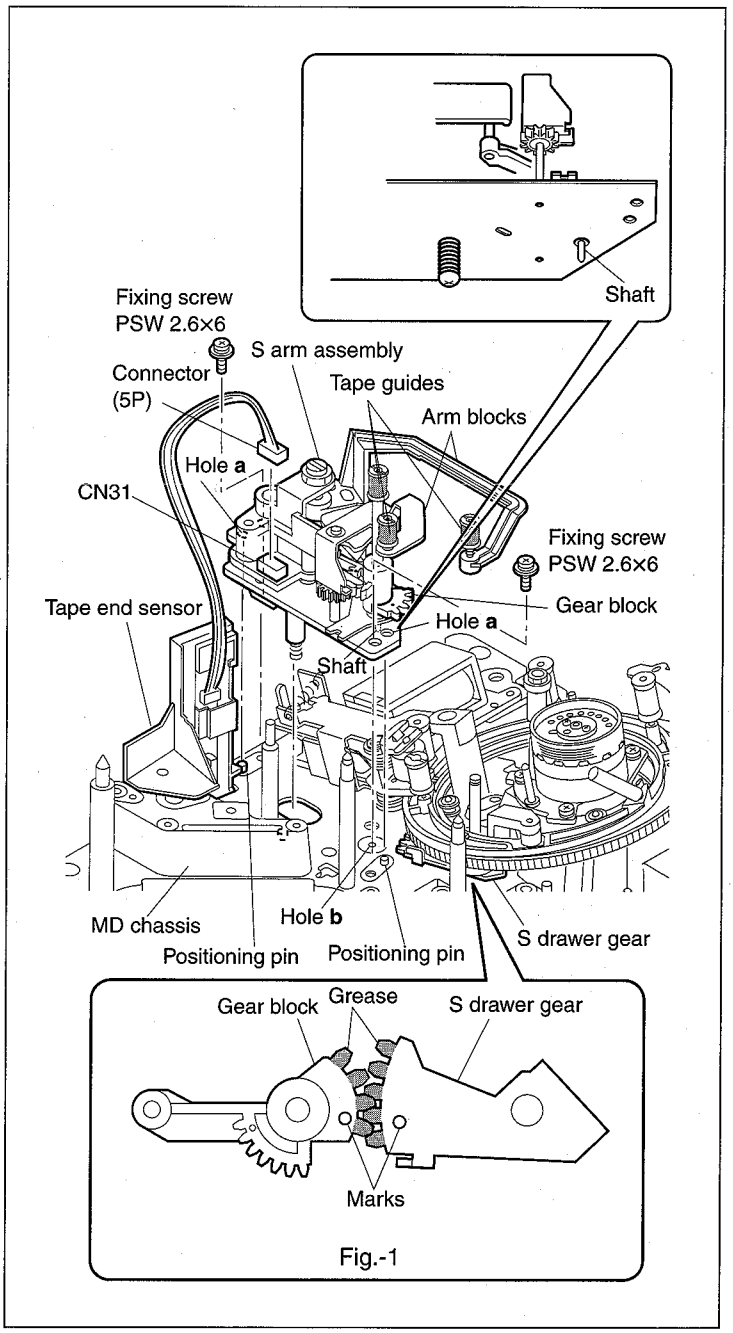


Fig.-1

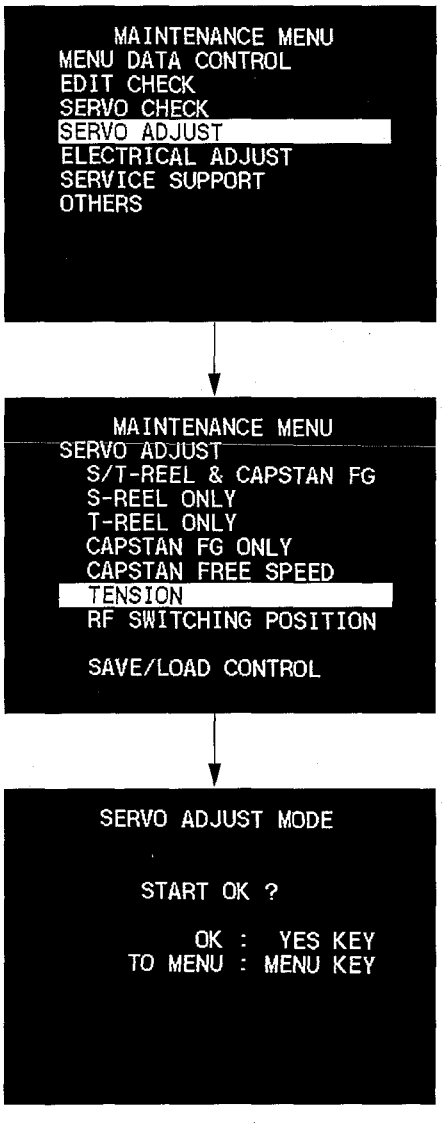
6-23-1. FWD/REV Back Tension Adjustment

Mode
PLAY mode

Tool
DV torque cassette : J-6082-373-A

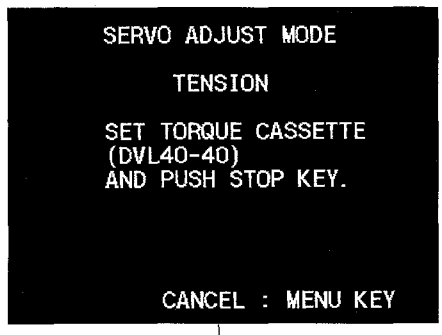
Preparation
Connect a video monitor to the VIDEO OUTPUT2 connector and show characters on screen.

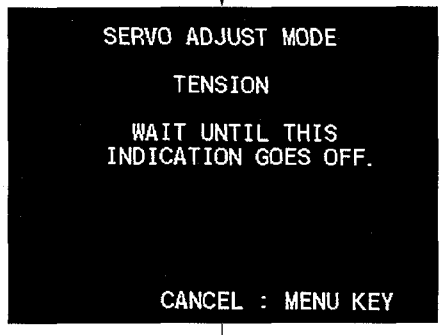
1. Remove the cassette compartment.
2. Turn on the main power and press the [EJECT] key.
   Note : Be careful that the cassette compartment connection cable must not be shorted when the main power is turned back on.
3. Show "MAINTENANCE MENU" on monitor display.
4. Select the item "SERVO ADJUST" using the [↑], [↓] keys.
5. Press the [→] key to show the next display.
6. Select the item "TENSION" among the servo adjustment using the [↑], [↓] keys.
7. Press the [→] key to show the next display.
8. When preparation is complete, press the [YES] key to start adjustment.



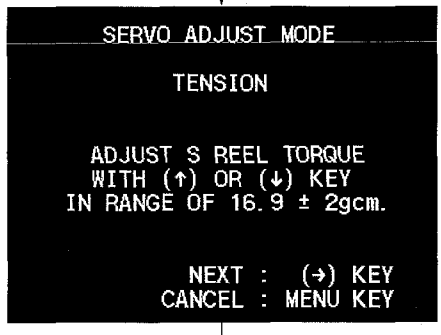
Adjustment After Replacement

9. Insert the DV torque cassette. Place a weight of about 300 g and press the [STOP] key.
10. When tape threading is complete, the unit enters the SEARCH mode automatically, then the PLAY mode.

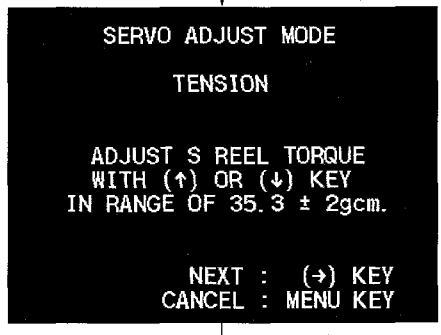




11. Keep pressing the [↑], [↓] keys to make adjustment until the DV torque cassette indicates 16.9 ±2 g•cm.
12. When the adjustment is complete, press the [→] key.

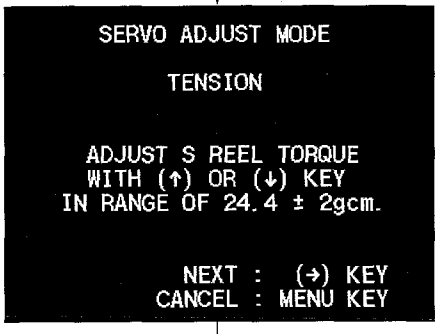


13. Keep pressing the [↑], [↓] keys in the same way to make adjustment until the DV torque cassette indicates 35.3 ±2 g•cm.
14. When the adjustment is complete, press the [→] key.

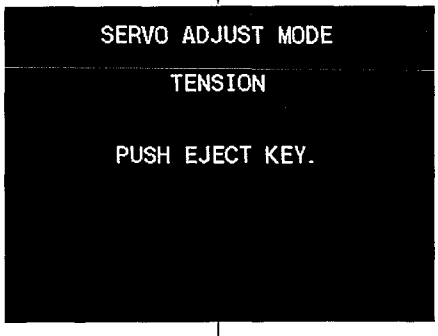


15. Confirm that the DV torque cassette indicates 21.8 ±3 g•cm.
16. Press the [→] key to enter the next display.
    (Unit enters the REV mode automatically.)

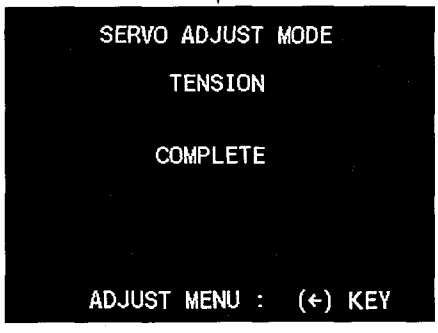
17. Adjust the REV holdback tension until 24.4 ±2 g•cm is obtained by pressing the [↑], [↓] keys.
18. Press the [→] key to enter the next display.



19. Press the [EJECT] key to remove a DV torque cassette.



20. Confirm that the "COMPLETE" message appears on screen.



- When adjustment is complete, turn on the main power and attach the cassette compartment.

6-24. GUIDE ROLLER ASSEMBLY (TG-1) REPLACEMENT

Tools

Tape guide adjustment driver : J-6441-560-A
Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01

Removal

1. Remove the top flange by turning it in the direction of arrow.
   Note : Do not turn the fixing screw which is painted by screw locking compound.
2. Remove the guide roller assembly.
3. Remove the bottom flange and the compression coil spring.

Attachment

4. Clean outside of the shaft of the S arm base assembly with the cleaning cloth moistened with cleaning fluid.
5. Insert the compression coil spring and the bottom flange into the shaft.
6. Insert the new guide roller assembly into the shaft in the direction as shown.
7. Revolve the top flange to attach it to the shaft.
8. Clean the guide roller assembly, top flange and bottom flange with a cleaning cloth moistened with cleaning fluid.

Adjustment After Replacement

9. Perform the Tape Path Adjustment.
   (Refer to section 7-2.)

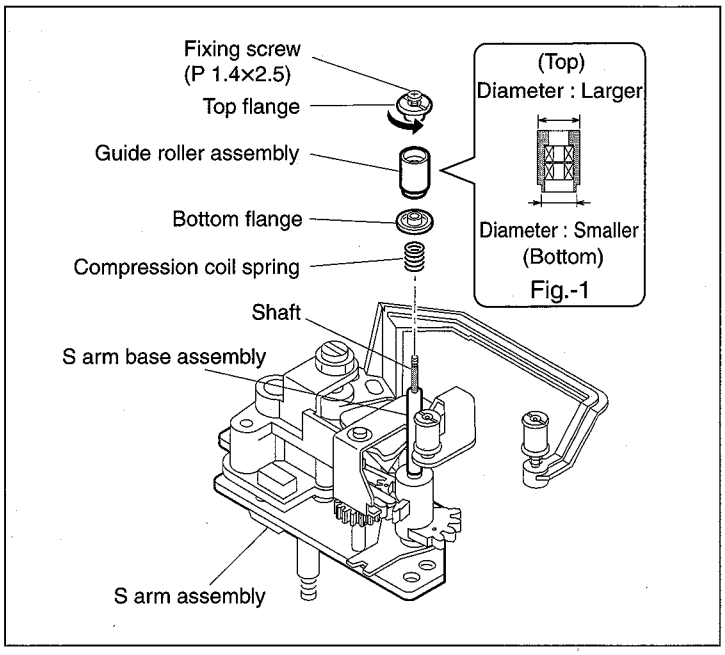


Fig.-1

6-25. GUIDE ROLLER ASSEMBLY (TG-2) REPLACEMENT

Tools

Tape guide adjustment driver : J-6441-560-A
Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01

Removal

1. Remove the top flange by turning it in the direction of arrow.
   Note : Do not turn the fixing screw which is painted by screw locking compound.
2. Remove the guide roller assembly.
3. Remove the bottom flange and the compression coil spring.

Attachment

4. Clean outside of the shaft of the S drawer arm assembly with the cleaning cloth moistened with cleaning fluid.
5. Insert the compression coil spring and the bottom flange into the shaft.
6. Insert the new guide roller assembly into the shaft in the direction as shown. (Fig.-1)
7. Revolve the top flange to attach it to the shaft.
8. Clean the guide roller assembly, top flange and bottom flange with a cleaning cloth moistened with cleaning fluid.

Adjustment After Replacement

9. Perform the Tape Path Adjustment. (Refer to section 7-2.)

Note : Be careful not to apply force to the S drawer arm during removal and attachment works. The external force to the S drawer arm can give adverse effect on the perpendicularity of the arm which causes the tape path adjustment error.

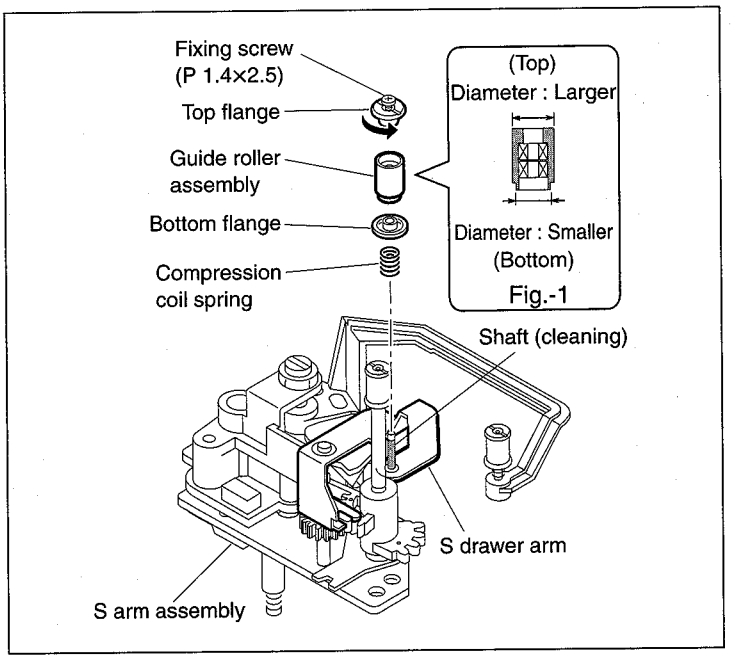


Fig.-1

6-26. TR ROLLER ASSEMBLY (TG-3) REPLACEMENT

Tools

Tape guide adjustment driver : J-6441-560-A
Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01
Thickness gauge : 9-911-053-00

Removal

1. Loosen the fixing screw as shown by revolving it 1 to 2 turns.
2. Remove the top flange by turning it in the direction of arrow.
3. Remove the TR roller assembly.
4. Remove the bottom flange and the compression coil spring.

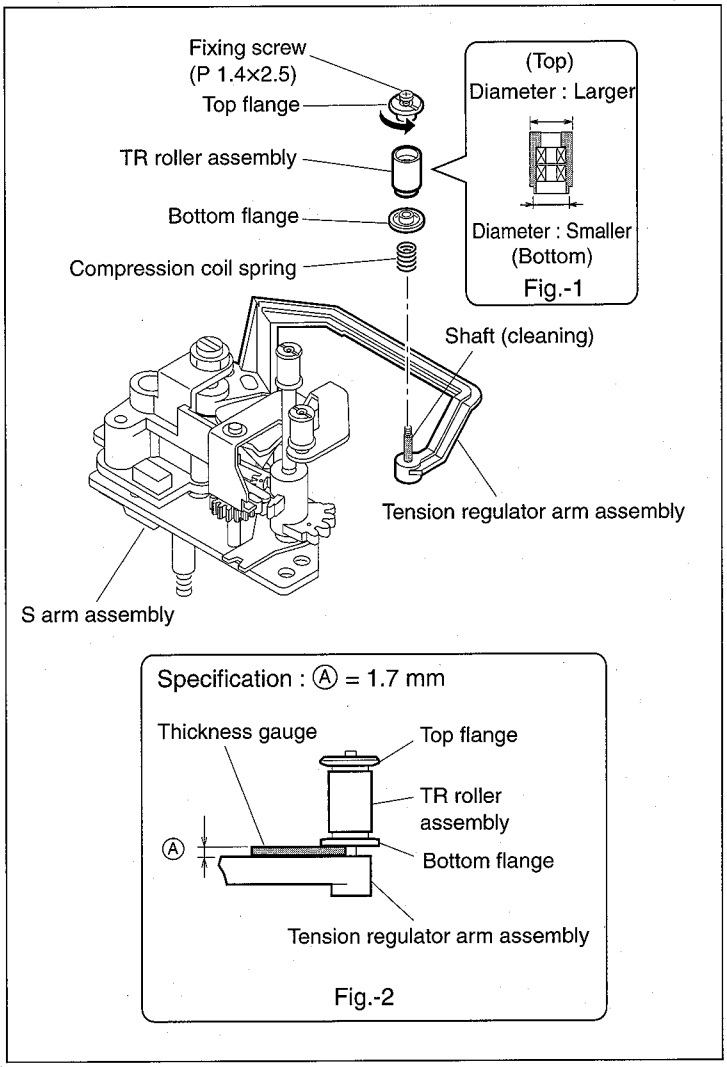
Attachment

5. Clean outside of the shaft of the S tension regulator arm assembly with the cleaning cloth moistened with cleaning fluid.
6. Insert the compression coil spring and the bottom flange into the shaft.
7. Insert the new TR roller assembly into the shaft in the direction as shown.
8. Revolve the top flange until the clearance between the tension regulator arm assembly and the bottom flange satisfies the specification, and fix the top flange to the shaft. (Fig-2.)
9. Clean the TR roller assembly, top flange and bottom flange with a cleaning cloth moistened with cleaning fluid.

Adjustment After Replacement

10. Perform the Tape Path Adjustment. (Refer to section 7-2.)

Note : Be careful not to apply force to the tension regulator arm assembly during removal and attachment works. The external force to the tension regulator arm assembly can give adverse effect on the perpendicularity of the tension regulator arm assembly which causes the tape path adjustment error.



6-27. GUIDE ROLLER ASSEMBLY (TG-6) REPLACEMENT

Tools

Tape guide adjustment driver : J-6441-560-A
Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01

Removal

1. Remove the TG-6A nut by revolving it by turning it in the direction of arrow.
   Note : Do not turn the fixing screw which is painted by screw locking compound.
2. Remove the TG-6A upper flange.
3. Remove the TG-6A guide roller assembly.
4. Remove the TG-6A lower flange and the compression coil spring.

Attachment

5. Clean outside of the shaft of the TG-6 assembly with the cleaning cloth moistened with cleaning fluid.
6. Insert the compression coil spring and the TG-6A bottom flange into the shaft.
7. Insert the new TG-6A guide roller assembly into the shaft in the direction as shown. (Fig.-1)
8. Insert the TG-6A upper flange into the shaft.
9. Attach the TG-6A nut to the guide roller assembly. Revolve the top flange until it stops to attach the top flange to the shaft.
10. Clean the TG-6A guide roller assembly, TG-6A top flange and TG-6A bottom flange with a cleaning cloth moistened with cleaning fluid.

Adjustment After Replacement

11. Perform the Tape Path Adjustment.
    (Refer to section 7-2.)

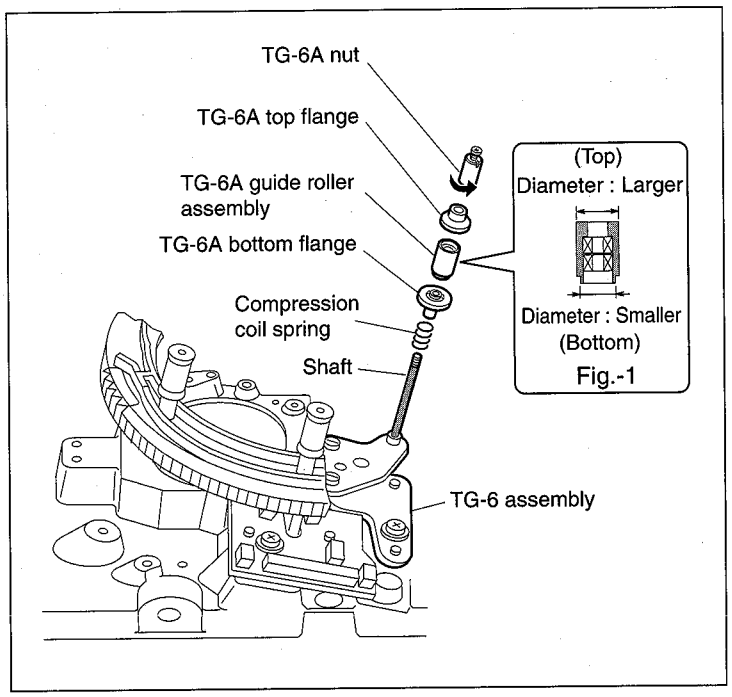


Fig.-1

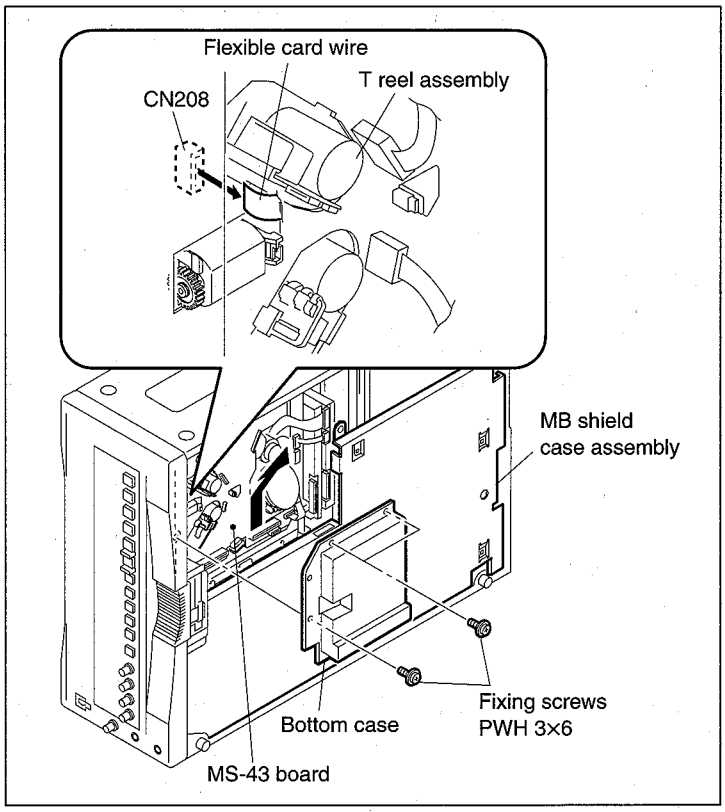
6-28. CASSETTE MEMORY TERMINAL REPLACEMENT

Tools

Sony grease (SGL-601) : 7-651-000-10

Removal

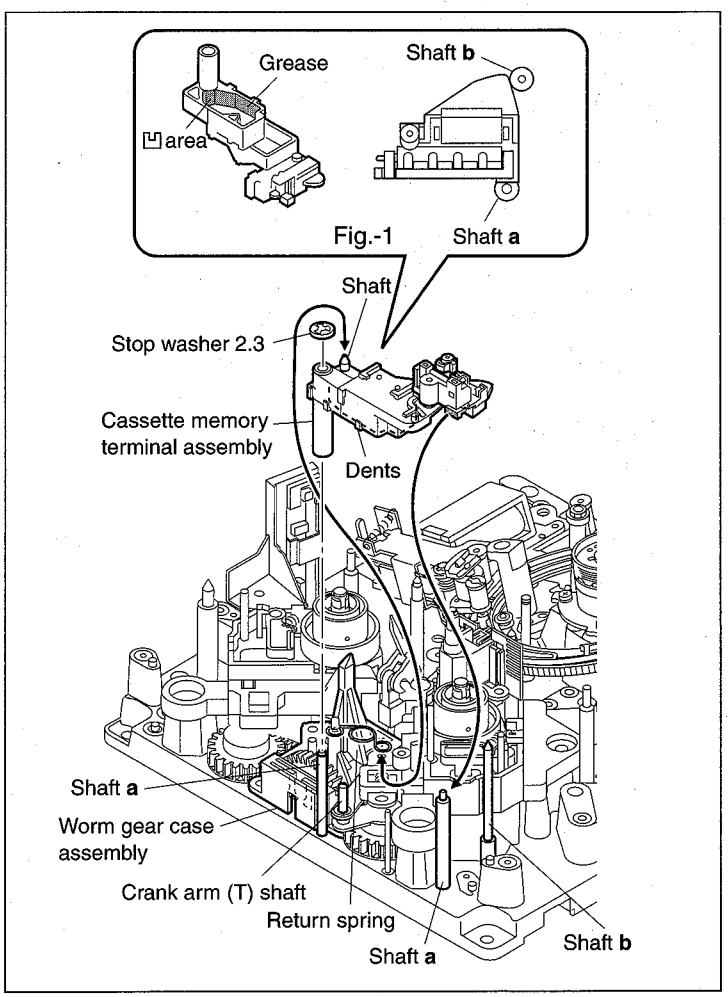
1. Place this unit with its left side down.
2. Remove the three screws (PWH 3×6) fixing the bottom case to the MD chassis, and remove the bottom case in the direction of arrow.
3. Remove the flexible card wire of the cassette memory terminal assembly from CN208 on the MS-43 board.



4. Place the unit horizontally.
5. Remove the return spring of the worm gear case assembly from the shaft of the cassette memory terminal assembly.
6. Remove the stop washer 2.3 from the shaft "**a**" of the MD chassis, and remove the cassette memory terminal assembly.

Attachment

7. Coat the oblique line area of the new cassette memory terminal with grease. (Fig.-1)
8. While inserting the cassette memory terminal assembly into the shaft "**a**" of the MD chassis, insert the crank arm assembly (T) axis into the recessed portion. Attach the cassette memory terminal assembly so that the assembly is positioned in relation to shafts "**a**" and "**b**" as shown.
9. Fix the cassette memory terminal assembly with the stop washer 2.3.
10. Hook the return spring as shown.
11. Attach the disassembled parts by reversing the removal procedure from steps 3 to 1.



6-29. FAN MOTOR REPLACEMENT

Tools

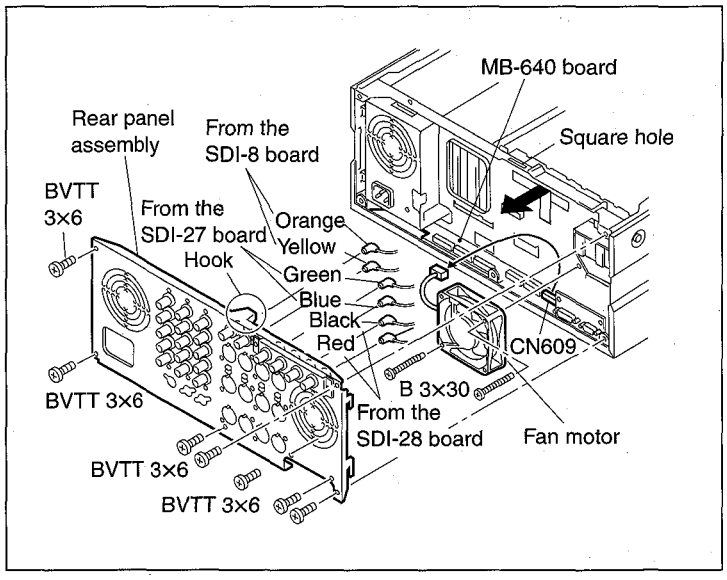
Screw locking compound : 7-432-114-11
(Three Bond-1401B)

Removal

1. Remove the seven screws (BVTT 3×6) securing the rear panel assembly, and remove the rear panel assembly.
2. Remove the two connectors (orange, yellow) from the SDI-8 board, the two connectors (green, blue) from the SDI-27 board and the two connectors (black, red) from the SDI-28 board.
3. Remove the 3-pin connector coming from the fan motor, on CN609 on the MB-640 board.
4. Remove the two fixing screws (B 3×30) and remove the fan motor.

Attachment

5. Attach the new fan motor to the chassis with two fixing screws. Apply the screw locking compound.
6. Attach the disassembled parts by reversing the removal procedure from steps 3 to 1.



6-30. HEAD CLEANER ASSEMBLY REPLACEMENT

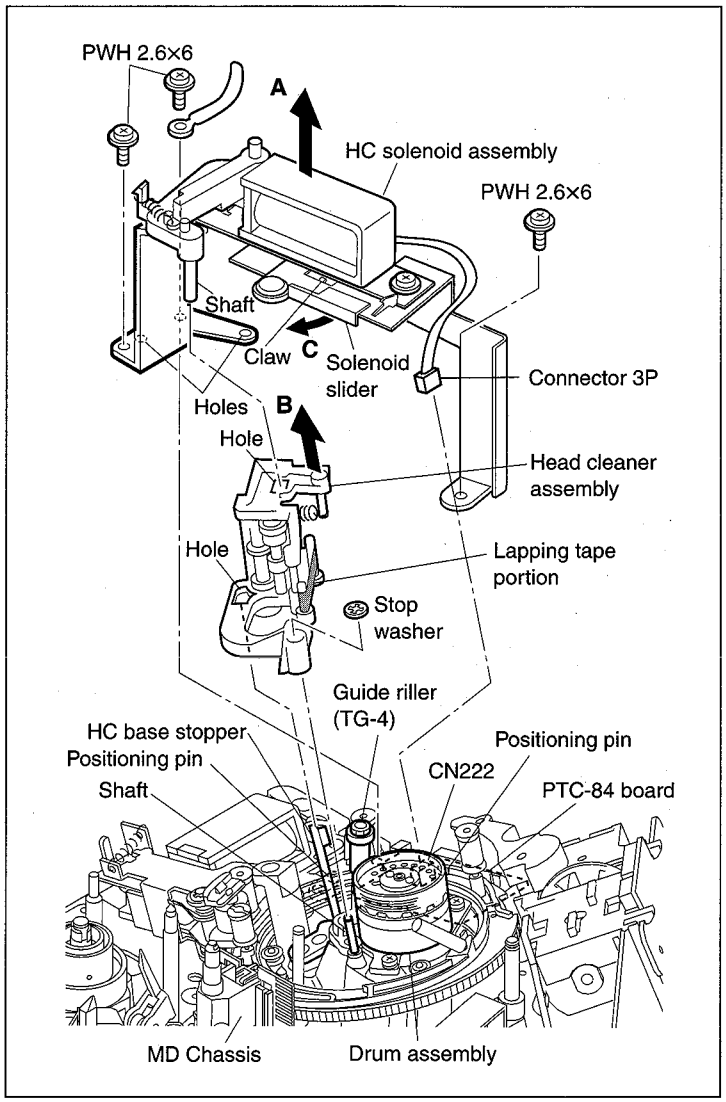
Note : Be careful not to give any scars to the guide rollers in the vicinity the drum when removing the HC solenoid assembly or the head cleaner assembly.

Removal

1. Remove the connector (3 pins) CN222 from the PTC-84 board on the MD chassis.
2. Release the rock of solenoid slider claw and move the solenoid slider in the direction of arrow **C**.
3. Remove the three screws (PWH 2.6×6) securing the HC solenoid assembly, and remove the HC solenoid assembly in the direction of arrow **A**.
4. Remove the stop washer 1.5 from the shaft of the MD chassis, and remove the head cleaner assembly in the direction of arrow **B**.

Attachment

5. While passing the lapping tape portion of the new head cleaner assembly in between the guide roller (TG-4) and the drum assembly, insert the new head cleaner into the shaft of the MD chassis. Then pass the HC base stopper through the hole.
   Note : Be careful that the lapping tape is not caught by the drum or the guide rollers.
6. Attach the stop washer 1.5 to the head cleaner assembly.
7. Attach the disassembled parts by reversing the removal procedure from steps 3 to 1.



Check After Replacement

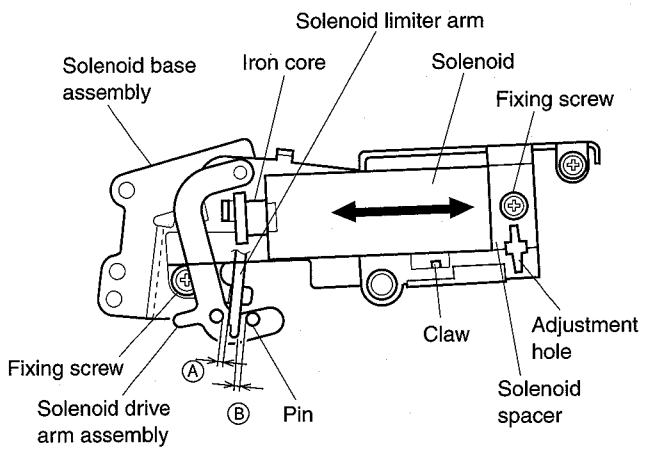
Mode

Establish the mechanical state in which the lapping tape portion of the new head cleaner assembly is pressed against the drum.

8. Confirm that the specification is satisfied when the iron core of the solenoid is energized.

Adjustment After Replacement

9. Loosen slightly the two screws fixing the solenoid spacer.
10. Insert the flat head (−) screwdriver into the adjustment hole of the solenoid spacer. Make adjustment by turning the screwdriver until the position of the solenoid limiter arm satisfies the specification.



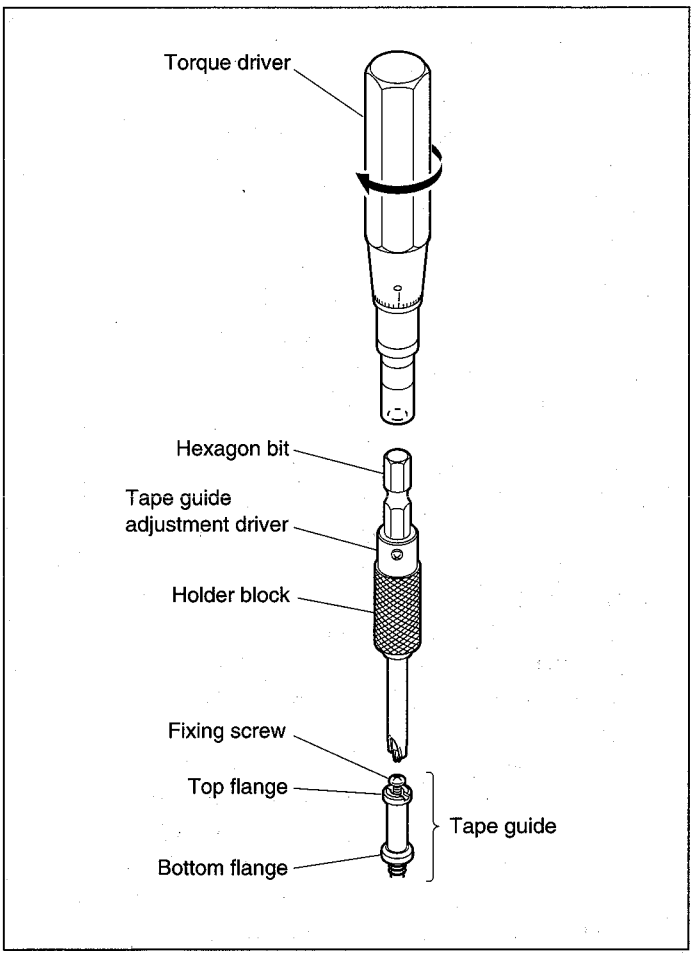
Specification : Clearance must be secured in between Ⓐ and Ⓑ.

SECTION 7
TAPE PATH ADJUSTMENT

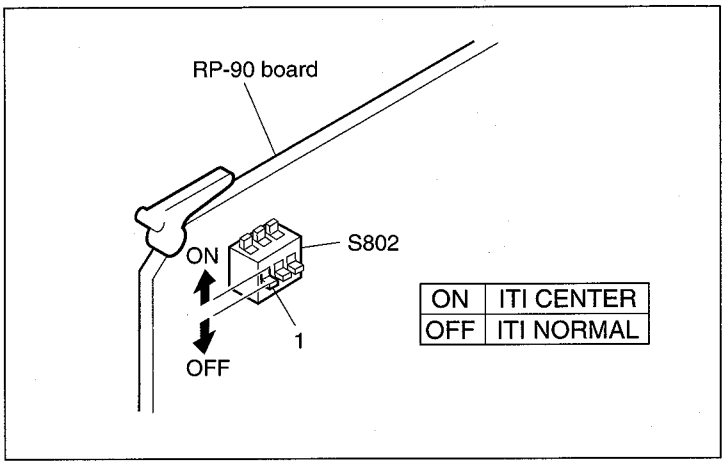
Tape path adjustment is very important adjustment to run tape under the optimum conditions for tape.
If this adjustment is not performed correctly, tape can be damaged.
Perform this adjustment with utmost attention.
Perform this adjustment after cassette compartment is removed from VTR.

7-1. GENERAL INFORMATION FOR TAPE PATH ADJUSTMENT

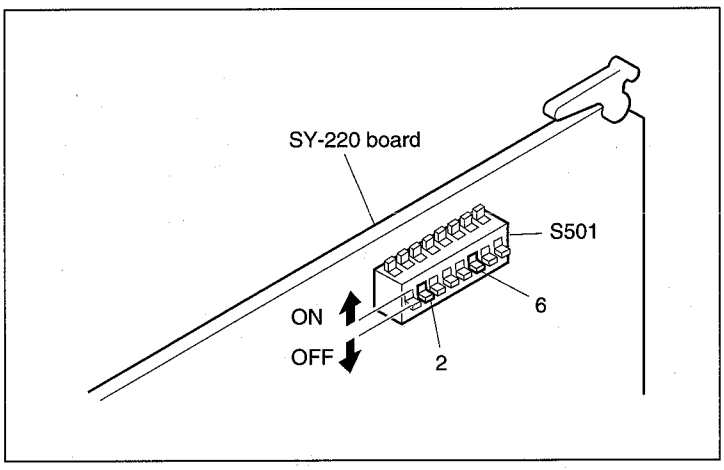
1. Alignment tape
   The following alignment tapes are necessary for tape path adjustment.
   - XH2-1AST (Standard cassette) : 8-967-999-02
   - XH5-1A2 (Standard cassette) : 8-967-999-22 (NTSC)
   - XH5-1AP2 (Standard cassette) : 8-967-999-26 (PAL)
2. Tape guide adjustment driver
   The following tape guide adjustment driver which is available as the Sony service tool is necessary for height adjustment of TG-1, TG-2 and TG-6. When tape guide height adjustment is completed, tighten the fixing screw on the top flange of tape guides using the torque driver as shown in the following procedure.
   - Tape guide adjustment driver : J-6440-850-A
   - Torque driver : J-6325-400-A
     Tightening torque : 0.06 to 0.07 N•m (0.6 to 0.7 kgf•cm)
   1) Set a torque driver to the hexagon bit on top of the tape guide adjustment driver.
   2) Set the tape guide adjustment driver to the top flange of tape guide. While grasping the holder block with hand so as not turn the top flange, turn the torque driver to tighten the fixing screw.
3. Height of TG-3 must be adjusted using the following nutdriver (width across flat 4.5 mm). Height of TG-4 and TG-5 must be adjusted using the following nutdriver (width across flat 4.5 mm) in the same way.
   - Nutdriver : 7-700-751-01 (width across flat 4.5 mm)
4. Cassette compartment
   Perform the tape path adjustment after cassette compartment is removed from VTR. When a cassette is set on the VTR, place a weight (about 300 g) on a cassette so that a cassette is securely fixed in position.

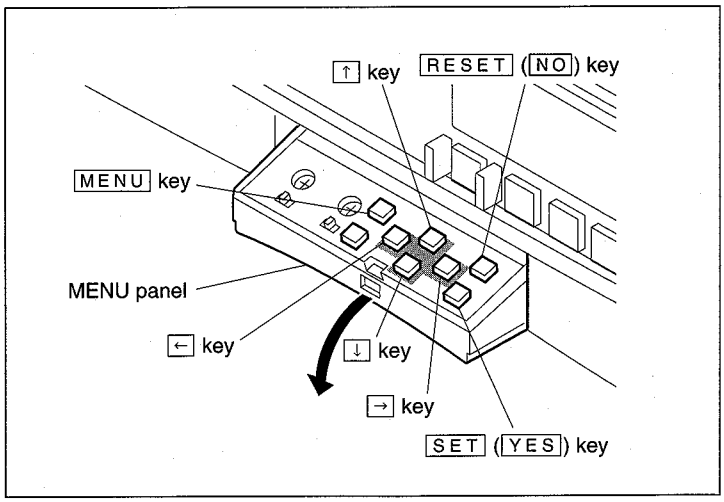


5. Selecting the servo mode
   (1) Select the servo mode "ITI CENTER" by setting the switch S802-1 on the RP-90 board to ON position when using the tracking alignment tape (XH2-1AST). (The servo loop will not lock in at the OFF position.)
   * The DSR-85/85P does not have the tracking shift function. Instead of having the tracking shift function, the tracking alignment tape XH2-1AST has already been recorded in the factory so that the servo is locked at 50 % off-track automatically.
   (2) Select the servo mode "ITI NORMAL" by setting the switch S802-1 on the RP-90 board to OFF position when using the tracking alignment tape (XH5-1A2, XH5-1AP2).
   (3) When all items of tape path adjustment are completed, be sure to confirm that the switch S802-1 on the RP-90 board is set to OFF position.
6. RF switching position preliminary adjustment
   When the RF switching position is greatly mistaken in such occasion as head drum replacement, there can be a case that the servo does not lock. In such a case, firstly perform section "7-4. TAPE PATH ADJUSTMENT (CHECKING AMOUNT OF TAPE CONTACT WITH TOP FLANGES AT ENTRANCE SIDE)". Secondly perform section "7-6. RF SWITCHING POSITION ADJUSTMENT". Then perform section "7-5. TAPE PATH ADJUSTMENT (TAPE PATH FINE ADJUSTMENTS AT ENTRANCE AND EXIT SIDES). After that, check the switching position again.
7. [×4] mode setting method
   (1) The [×4] mode can be established by setting the switch S501-2 (M-1) on the SY-220 board to ON position. When the [×4] mode is established, the [PLAY] and [REC] runs on the [×4] mode.
   (2) When all items of tape path adjustment are completed, be sure to confirm that the switch S501-2 on the SY-220 board is set to OFF position.
8. Preparation of tape path adjustment
   (1) Set the switch S802-1 (A-1) on the RP-90 board to ON position.
   (2) Clean the tape running surface of tape guides, head drum and video head using the cleaning cloth moistened with cleaning fluid.
      Cleaning cloth : 3-184-527-01
      Cleaning fluid : 9-919-573-01
   (3) Use a remote controller unit (SVRM-100) or remote controller (RM-450 or equivalent) to enter the SHUTTLE mode.

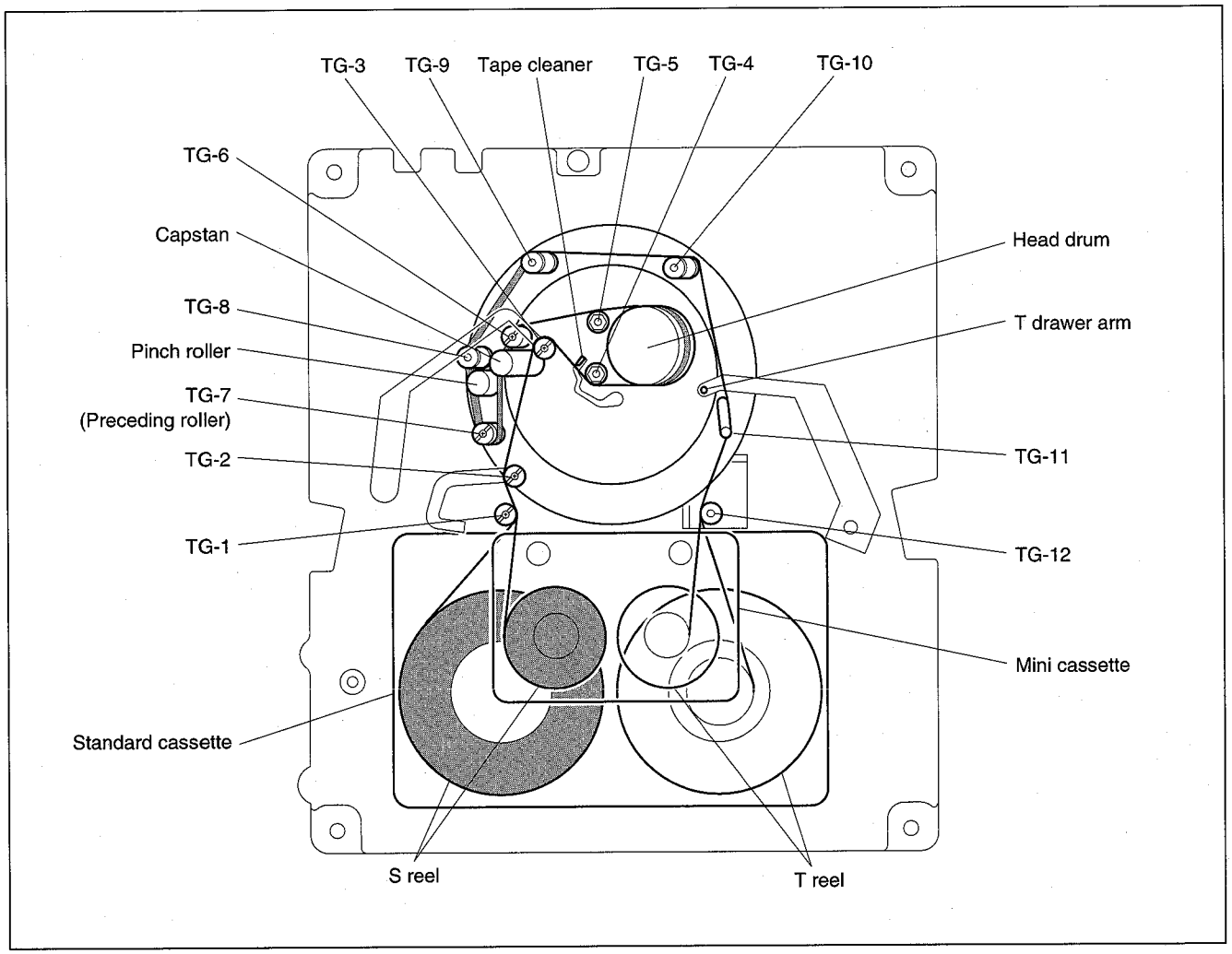


ON	ITI CENTER
OFF	ITI NORMAL

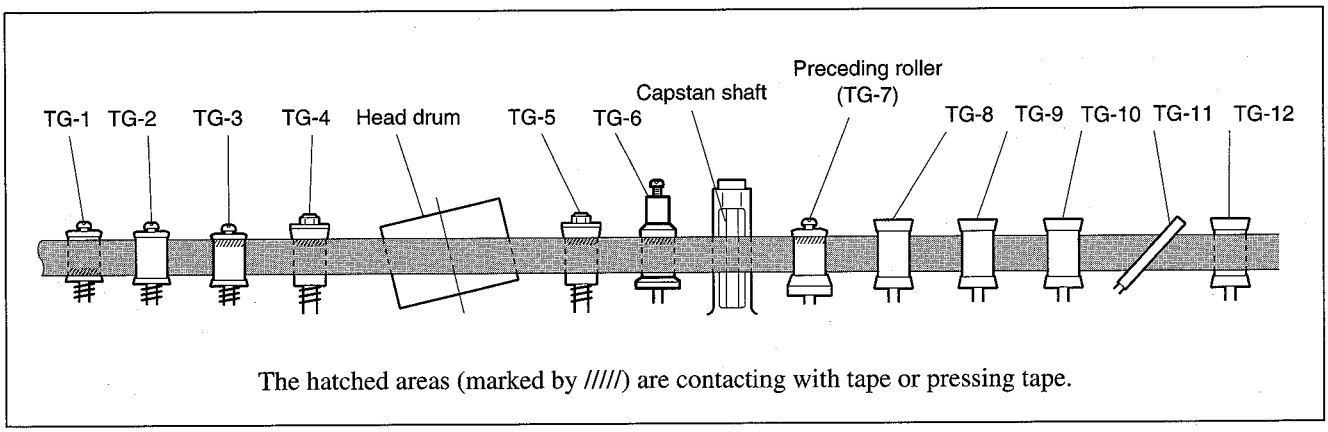




9. Tape guide locations
The tape guides which are referred to in the adjustment items are located as shown below.



10. Tape running condition



The hatched areas (marked by /////) are contacting with tape or pressing tape.

11. Measurement points and signals for adjustment

All of the RF signals (the signal after envelope detection) of the respective heads can be obtained from TP804 by switching the signals with S801 on the RP-90 board.

Signal Name	RP-90 S801 Setting	Board Name	TP Terminal (Address)
REC E1 PB RF	0	RP-90	TP804 (D-1)
REC E2 PB RF	1		
E1-PB	2		
E2-PB	3		
O2-PB	4		
O1-PB	5		
E1-SP	6		
E2-SP	7		
O2-SP	8		
O1-SP	9		
REC SW REF			TP801 (C-1)
GND			E101 (F-1)

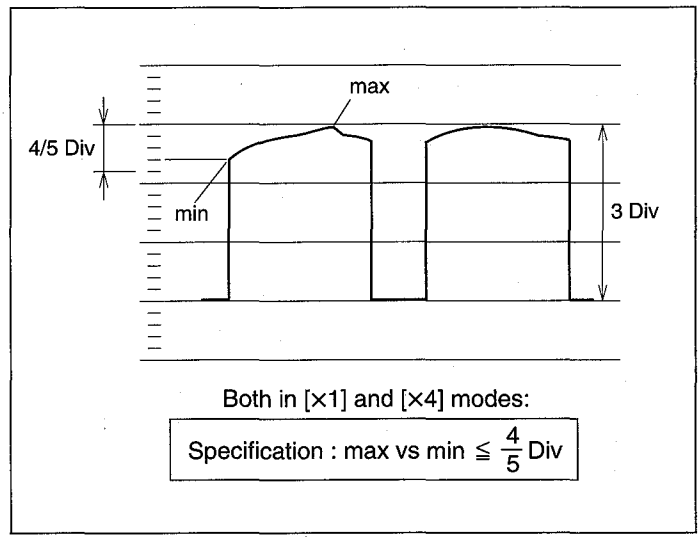
7-2. TAPE PATH CHECK

Required tools

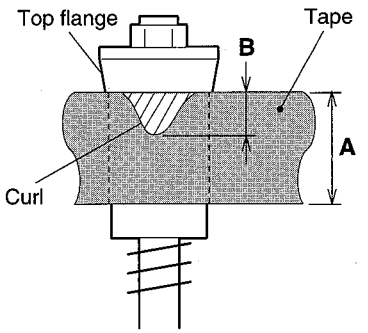
Alignment tape XH2-1AST : 8-967-999-02
Dual trace oscilloscope

Check procedure

1. Connect an oscilloscope as follows :
   CH-1 : TP804/RP-90 board (D-1)
   CH-2 : TP801/RP-90 board (C-1)
   TRIG : CH-2
2. Set the switch S801 (D-1) on the RP-90 board to "0".
3. Set the alignment cassette XH2-1AST (standard cassette) on the VTR and place a weight on a cassette so that a cassette is securely fixed in position.
4. Enter the PLAY mode.
5. Adjust the Variable VOLTS/DIV control of an oscilloscope so that the maximum amplitude of the RF waveform becomes the three DIVISIONs sharp on an oscilloscope.
6. Measure the minimum amplitude of the RF waveform and confirm that the amplitude difference between the maximum and the minimum portions of the RF waveform satisfies the specification.
7. Enter the [×4] mode and check the amplitude difference between the maximum and the minimum portions of the RF waveform in the same way.



8. Enter the [×1] mode and confirm that tape curl at the respective tape guides satisfies the specification.
   • Specification of tape curl amount
   (1) The tape curl amount at the top flanges of TG-3, TG-4 and TG-5 must satisfies the specification.
   (2) There must be no tape curl at TG-1's bottom flange, TG-6's top flange, TG-7's top flange and drum rabbet guide (both entrance and exit).



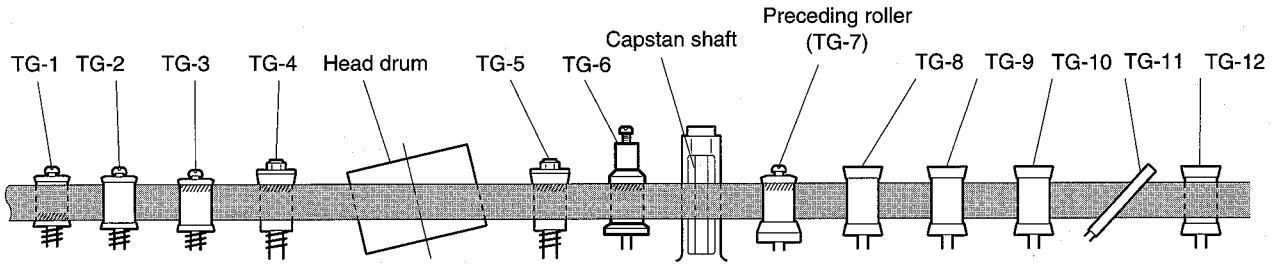
TG-3 top flange

Specification : $\frac{B}{A} \leqq \frac{1}{20}$

TG-4 and TG-5 top flange

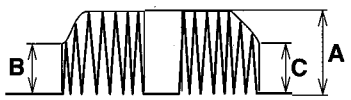
Specification : $\frac{B}{A} \leqq \frac{1}{30}$

Tape running condition



The hatched areas (marked by /////) are contacting with tape or pressing tape.

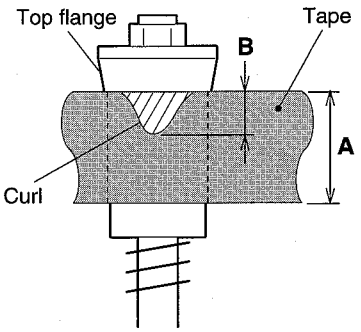
   • Tape path at TG-2
   There must be clearance between tape edge and top flange, and between that and bottom flange when tape runs at TG-2.



Specification : $\frac{B}{A}, \frac{C}{A} \geqq 90\%$

9. The RF waveform must satisfy the specification during FF and REW modes.

10. Enter the FF and REW modes and confirm that tape curl at the respective tape guides satisfies the specification.
   • Specification of tape curl amount
   (1) The tape curl amount at the top flanges of TG-3, TG-4 and TG-5 must satisfies the specification.
   (2) There must be no tape curl at TG-1's bottom flange, TG-6's top flange, TG-7's top flange and drum rabbet guide (both entrance and exit).



TG-3 top flange

Specification : $\frac{B}{A} \leqq \frac{1}{20}$

TG-4 and TG-5 top flange

Specification : $\frac{B}{A} \leqq \frac{1}{30}$

11. If the specifications shown in steps 5 to 10 are not satisfied, perform sections "7-3. TAPE PATH ADJUSTMENT (CHECKING AMOUNT OF TAPE CONTACT WITH TOP FLANGES AT EXIT SIDE)" and "7-4. TAPE PATH ADJUSTMENT (CHECKING AMOUNT OF TAPE CONTACT WITH TOP FLANGES AT ENTRANCE SIDE)".

7-3. TAPE PATH ADJUSTMENT (CHECKING AMOUNT OF TAPE CONTACT WITH TOP FLANGES AT EXIT SIDE)

Required tools

Alignment tape XH2-1AST : 8-967-999-02
Tape guide adjustment driver : J-6440-850-A
Dental mirror : J-6080-029-A
Dual trace oscilloscope
Nutdriver (width across flat 4.5 mm) : 7-700-751-01

Check procedure

1. Connect an oscilloscope as follows :
   CH-1 : TP804/RP-90 board (D-1)
   CH-2 : TP801/RP-90 board (C-1)
   TRIG : CH-2
2. Set the alignment cassette XH2-1AST (standard cassette) on the VTR and place a weight on a cassette so that a cassette is securely fixed in position.
3. Enter the PLAY mode.
4. Move TG-5 and TG-6 toward their top flange direction so that there are clearances between tape edge and top flange of TG-5 and between that and top flange of TG-6.
5. Confirm that there are clearances between tape edge and top flange ("**A**" portion) of TG-5, and between that and top and bottom flanges of TG-6. ("**B**" and "**C**" portions) (Fig.-1)

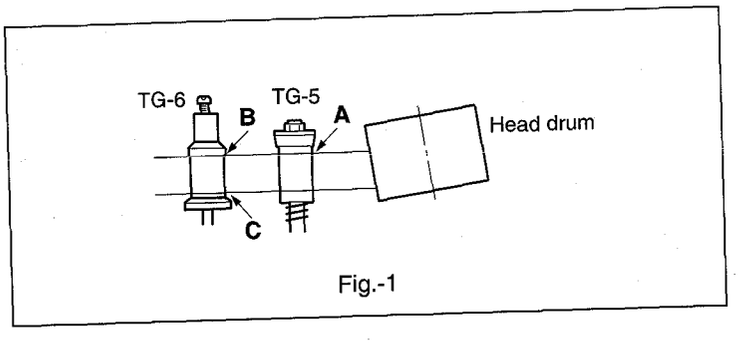


Fig.-1

6. If the waveform is not stable and it is difficult to count the number of peaks, tune the RF switching position temporalily. (Refer to section 7-6.)
7. Confirm that the amount of tape contact at exit is in the specification. (Fig.-2)
   < If the specification is not satisfied > (Fig.-3)
   a) When the amount of tape contact is smaller (when numbers of peak are smaller than specification)
      Turn the AZ screw of TG-6 counter-clockwise. Confirm that there are clearances at "**A**" and "**B**" of TG-5 and TG-6.
   b) When the amount of tape contact is too much (when numbers of peak are more than specification)
      Turn the AZ screw of TG-6 counter-clockwise. Confirm that there are clearances at "**C**" of TG-6.

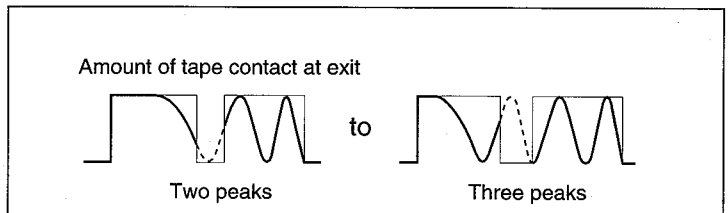
   Note : Start counting the numbers of peak after the tape run is fully stabilized.

8. After confirming the amount of tape contact with top flange at the exit side, write down a marking on the top flange. (Fig.-4)
9. Turn the top flange of TG-6 clockwise until the RF waveform becomes the waveform as shown in Fig.-4.

   Note : The top flange of TG-6 can be easily moved. Confirm the amount of tape contact with top flange and also confirm that a marking on the top flange has not moved i.e., stays in the original marked position.

10. Tighten the fixing screw of TG-6 lightly.

    Note : Never press TG-6 downward strongly.



<Amount of tape contact at exit>
Specification : Numbers of peaks are two or three when there are clearances between tape and TG-5's top flange, and between tape and top and bottom flanges of TG-6.

Fig.-2

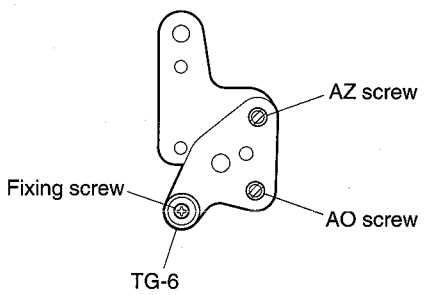


Fig.-3

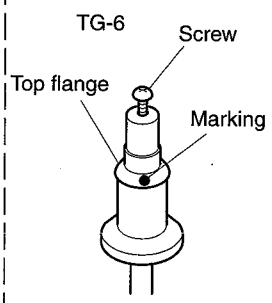


Fig.-4

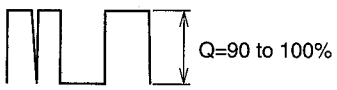


Fig.-5

7-4. TAPE PATH ADJUSTMENT (CHECKING AMOUNT OF TAPE CONTACT WITH TOP FLANGES AT ENTRANCE SIDE)

Required tools

Alignment tape XH2-1AST : 8-967-999-02
Tape guide adjustment driver : J-6440-850-A
Dental mirror : J-6080-029-A
Dual trace oscilloscope
Nutdriver (width across flat 4.5 mm) : 7-700-751-01

Check procedure

1. Connect an oscilloscope as follows:
   CH-1 : TP804/RP-90 board (D-1)
   CH-2 : TP801/RP-90 board (C-1)
   TRIG : CH-2
2. Set the alignment cassette XH2-1AST (standard cassette) on the VTR and place a weight on a cassette so that a cassette is securely fixed in position.
3. Enter the PLAY mode. If the tape in VTR is not at the tape top, rewind the tape to the tape top.
   * Tape top is the area which is 7 minutes or less from the tape top of a reel.

Note : Perform rewinding a tape after creating a clearance at the bottom flange of TG-1 and before creating a clearance at the top flange (E and G portions) of TG-3 and TG-4. If a tape is rewound while tape edge is contacting with the TG-1 bottom flange, and after a clearance is created between tape and top flange of TG-3 and TG-4, tape will not be wound around a reel with its bottom edge contacting the reel hub. It results in the incorrect number of peaks of waveform.

4. Turn the guide height adjustment nut of each TG-3 and TG-4 counter-clockwise so that there are clearances between tape edge and top flanges of TG-3 and between that and top flange of TG-4. Confirm that there are clearances between tape edge and the following portions: between tape and the top flange (**A** portion) of TG-1, top flange (**C**, **D**, **E**, **F** portions) of TG-2, and -3, and top flange (**G** portion) of TG-4. (Fig.-1)
5. Confirm that the amount of tape contact at entrance is in the specification. (Fig.-2)
   < If the specification is satisfied >
   Turn the TG-1's top flange counter-clockwise until numbers of peak increase by 0.5 peaks (half peak). Then tighten the fixing screw to fix the top flange.

   < If the specification is not satisfied >
   a) When the amount of tape contact is smaller (when numbers of peak are smaller than specification)
      1) Turn the top flange of TG-1 counter-clockwise until tape is raised by the bottom flange. When numbers of peak become 3 to 4 peaks, fix the top flange.
      2) Confirm that there are clearances at "**C**", "**D**", "**E**" and "**G**" of TG-2, TG-3 and TG-4.
   b) When the amount of tape contact is too much (when numbers of peak are more than specification)
      Confirm that tape is wound around a reel with its bottom edge contacting the reel hub. Confirm also that the tape top is used.

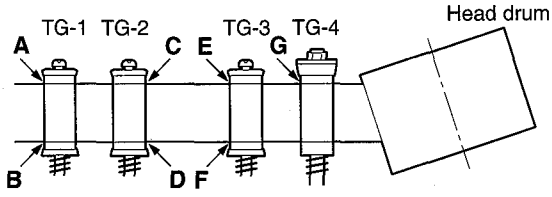
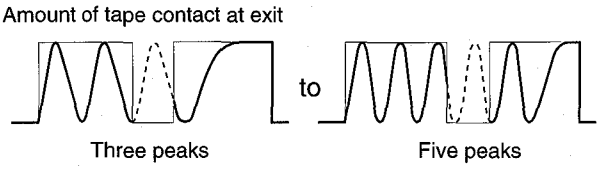


Fig.-1



<Amount of tape contact at exit>
Specification : Number of peaks are three to five when there are clearances between tape edge and top flange ("G" portion) of TG-4, and between that and top and bottom flanges of TG-1, TG-2 and TG-3.

Fig.-2

Note : When numbers of peaks are too much, confirm that TG-1 and TG-2 are rotating. Check also that tape is not pushed by the TG-1's lower flange excessively.

6. Turn the height adjustment nut of TG-3 until the RF waveform becomes the waveform as shown in Fig.-4. Confirm that the tape contacts to the top flange of TG-3 at "**E**", and the same time, confirm that there are clearances at "**C**" and "**D**" of TG-2. When there is no clearance, adjust height of TG-2 flange.

7. Press [EJECT] key and remove the weight of cassette and alignment tape.

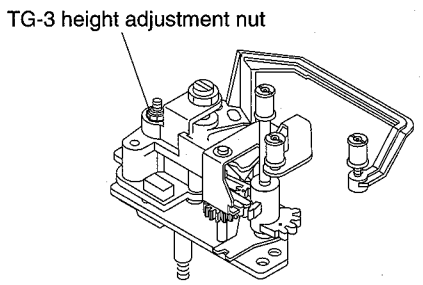


Fig.-3

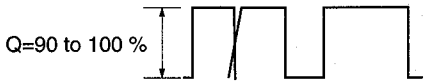


Fig.-4

7-5. TAPE PATH ADJUSTMENT (TAPE PATH FINE ADJUSTMENTS AT ENTRANCE AND EXIT SIDES)

Required tools

Alignment tape XH2-1AST : 8-967-999-02
Tape guide adjustment driver : J-6440-850-A
Nutdriver (width across flat 4.5 mm) : 7-700-751-01
Dual trace oscilloscope

Check procedure

1. Connect an oscilloscope as follows :
   CH-1 : TP804/RP-90 board (D-1)
   CH-2 : TP801/RP-90 board (C-1)
   TRIG : CH-2
2. Set the alignment cassette XH2-1AST (standard cassette) on the VTR and place a weight on a cassette so that a cassette is securely fixed in position.
3. Enter the PLAY mode.
4. Adjust the Variable VOLTS/DIV control of an oscilloscope so that the maximum amplitude of the RF waveform becomes the three DIVISIONS sharp on an oscilloscope. (Fig.-1)

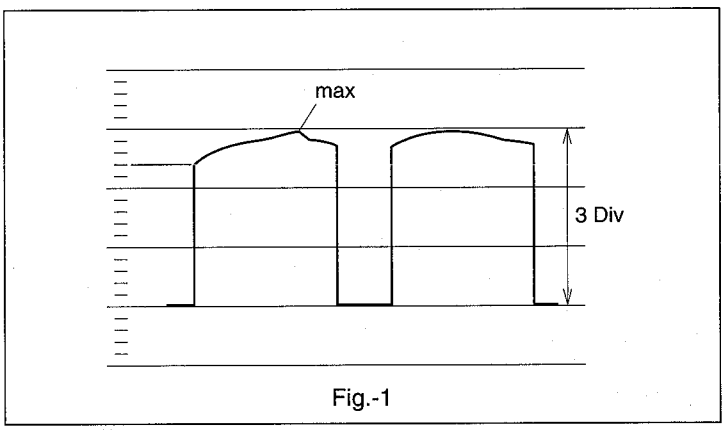


Fig.-1

5. Adjustment of Tape-to-top-flange contact at entrance
   (1) Turn the TG-3 guide height adjustment nut counter-clockwise so that tape does not contact with the flanges. Turn the TG-3 guide height adjustment nut in clockwise direction. Adjust the variable VOLTS/DIV control of an oscilloscope so that the peak amplitude of waveform at the entrance of drum becomes five divisions sharp on an oscilloscope. (Fig.-2)
   (2) Press the areas (on the TR base plate) around the TG-3 height adjustment nut in the direction of the arrow until a clearance is created between the TR base plate and nut. Confirm that peak amplitude of the waveform becomes six divisions when pressing the TR base plate is released.
   (3) If the peak amplitude of six divisions cannot be obtained in step (2), adjust the TG-3 height adjustment nut by turning it in the counter-clockwise direction while taking the amount of waveform change between steps (2) and (3) into consideration.
   (4) Repeat steps (2) and (3) twice, and confirm that peak amplitude of waveform does not change and is six divisions.
   (5) Repeat the operation from STOP → PLAY several times and confirm that the waveform at the entrance side of a drum, is stabilized to the state as shown in step (4).

6. Adjustment of Tape-to-top flange contact at exit
   (1) Turn top flange of the TG-6 guide counter-clockwise so that tape does not contact with the flanges. Turn the top flange of the TG-6 guide in clockwise direction until the waveform shown in Fig.-2 is obtained at exit side. Confirm that the marking on the TG-6 top flange remains in the original position when the tape-to-top-flange contact is adjusted. If the marking has been moved, return the marking to the original position by turning the top flange.
   (2) Repeat the operation from STOP → PLAY several times and confirm that the waveform at exit side of a drum, is stabilized to the state as shown in Fig.-2.
   Tighten the top flange of TG-6.

Note:
- **Confirm that waveform does not change when the areas around the TG-3 height adjustment nut is gently pressed.**
- **TG-3 is supported by a strong spring. From the nature of the TG-3 structure, TG-3 has hysteresis during its height adjustment. Adjustment hysteresis can be removed by pressing the areas around the height adjustment nut gently one time.**

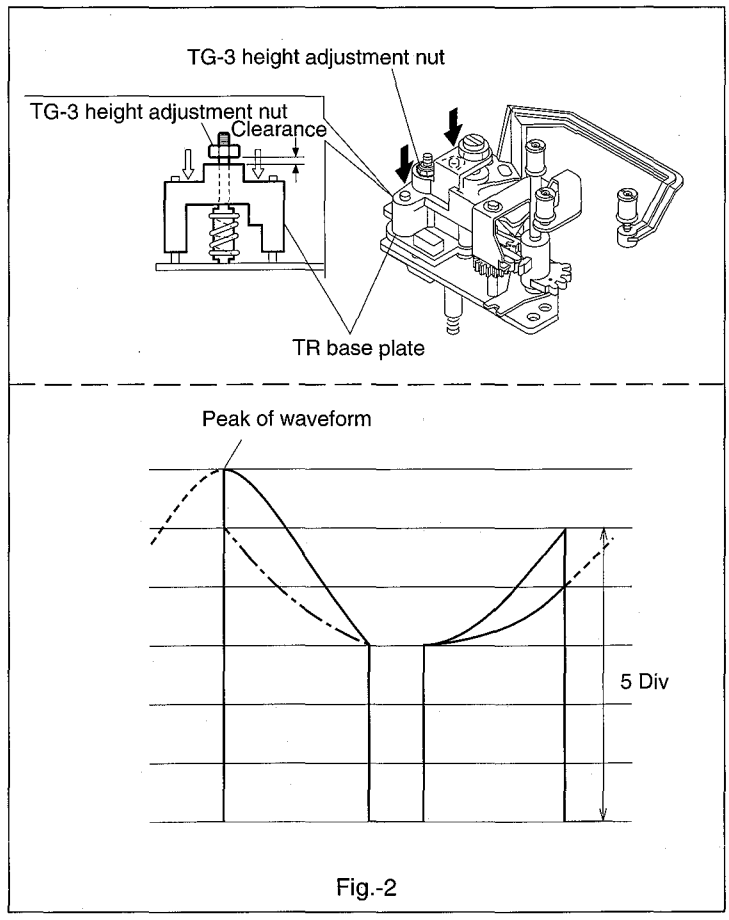


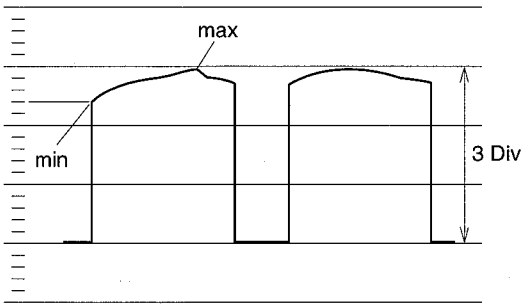
Fig.-2

7. Turn the TG-4 top flange clockwise until the RF waveform shown in Fig.-3 (entrance side) is obtained. Confirm that the tape curl at entrance side (TG-1, TG-3, TG-4 and drum rabbet guide) satisfies the specification.

Note :
- **Tape path adjustment are normally performed using the standard tape. When a mini-cassette is used for adjustment, clearance can occur between tape and bottom flange of TG-1 which is not an abnormal.**
- **End the TG-4 adjustment with clockwise rotation. (Do not end the adjustment with counter-clockwise rotation.)**

8. Turn the TG-5 top flange clockwise until the RF waveform shown in Fig.-3 (exit side) is obtained. Confirm that tape curl at exit side (TG-5, TG-6 and drum rabbet guide) satisfies the specification.

Note : End the TG-5 adjustment with clockwise rotation. (Do not end the adjustment with counter-clockwise rotation.)



Both in [×1] and [×4] modes :

Specification : max vs min ≦ $\frac{4}{5}$ Div

Fig.-3

9. Tape run check
   - TG-7 (Preceding guide) tape run check in PLAY mode
     (1) Set the alignment tape (XH2-1AST) and enter the PLAY mode.
     (2) Confirm that tape run at TG-7 satisfies the specification 1.

     Specification 1:

     There must be no curl of tape at the top flange of TG-7.

   - TG-7 (Preceding guide) tape run check in FF/REW modes
     (1) Set the alignment tape (XH2-1AST) and enter the FF and then REW modes.
     (2) Confirm that tape run at TG-7 satisfies the specification 2.

     Specification 2:
     - Tape must not show any unstable running up or down at TG-7.
     - There must be no curl of tape at both of the top and bottom flanges of TG-7.

   - RF waveform riseup check at REV x 1
     (1) Set the alignment tape (XH2-1AST). Confirm that the RF waveform satisfies the specification 3 when the machine changes the mode from FF to SHUTTLE -1.0.

     Specification 3:
     - There must be no curl of tape at both of the top and bottom flanges of TG-7.
     - The RF envelope waveform rises up in ten seconds at the exit of a drum.

     (2) Repeat step (1) twice.

10. Enter the 7. [×4] mode and confirm that waveform and tape curl satisfy the specification.

Specification of tape curl

- TG-1 bottom flange, TG-6 top flange and drum rabbet guide (entrance and exit)

  Specification : There must be no tape curl.

- TG-3 top flange

  Specification : $\frac{1}{20}$ of tape width or less

- TG-4 and TG-5 top flanges

  Specification : $\frac{1}{30}$ of tape width or less

7-6. RF SWITCHING POSITION ADJUSTMENT

Be sure to perform the RF switching position adjustment whenever the TAPE PASS ADJUSTMENT (refer to section 7-2) is performed.
This adjustment can be performed by the AUTO adjustment procedure and the MANUAL adjustment procedure. Perform the AUTO adjustment first. If the RF switching position adjustment cannot be completed by the AUTO adjustment, perform the MANUAL adjustment.

Preparation

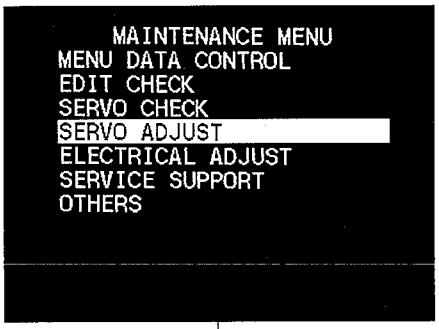
Connect the video monitor to the VIDEO OUTPUT 2 connector on the rear panel to show the characters on the display.

Tools

Alignment tape, XH5-1A2 : 8-967-999-22 (NTSC)
XH5-1AP2 : 8-967-999-26 (PAL)

[AUTO Adjustment]

1. Show the maintenance menu on the monitor screen.
   (1) While pressing the [←] key on the sub control panel, press the [MENU] key to show the maintenance menu.
2. Press the [↑], [↓] keys and select "SERVO ADJUST".

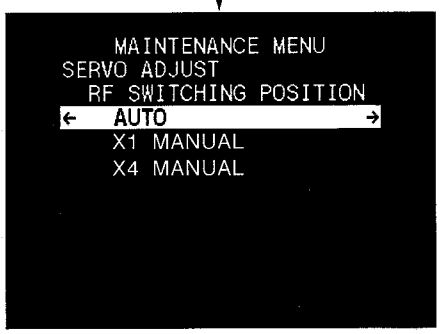


3. Press the [→] key to show the display ①.
4. Press the [↑], [↓] keys and select "RF SWITCHING POSITION".

①

5. Press the [→] key to show the display ②.
6. Press the [↑], [↓] keys and select "AUTO".

- **In case no further procedures are available, take the Manual adjustment.**

② 

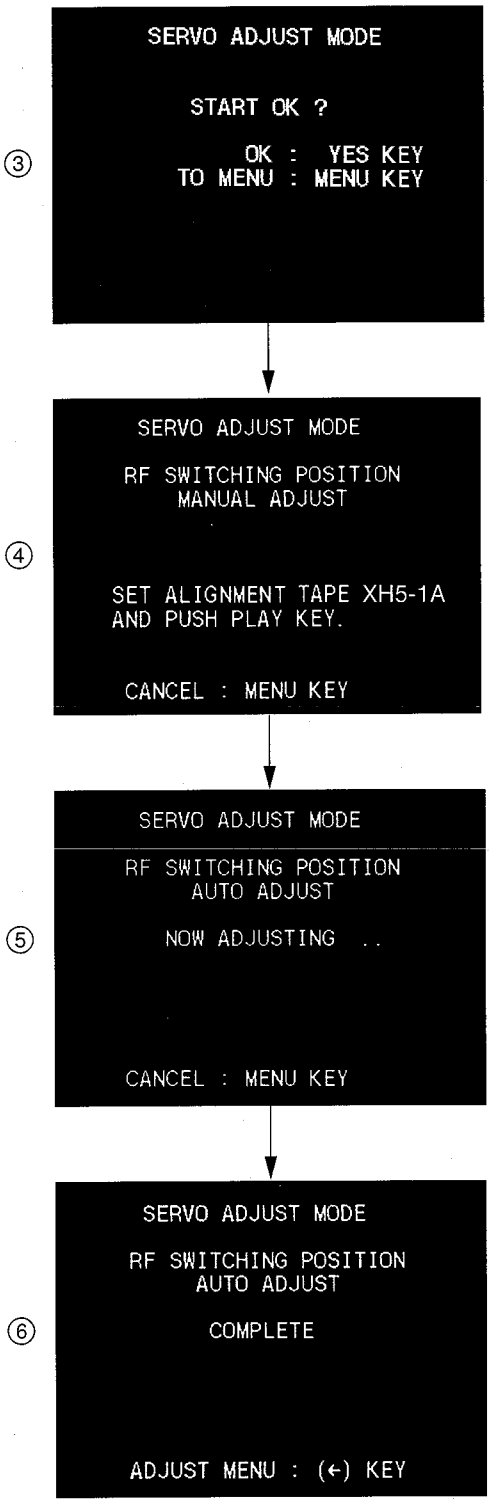
7. Press the [→] key to show the display ③ "START OK?".
8. Press the [YES] key.

9. Playback the alignment tape XH5-1A2. (display ④)
   Then the unit starts the RF switching position automatic adjustment. (display ⑤)

10. When the adjustment is complete, the display ⑥ "COMPLETE" appears.

    Note : When the display "ADJUST INCOMPLETE" appear on the monitor screen, check that the alignment which is played back is XH5-1A2.

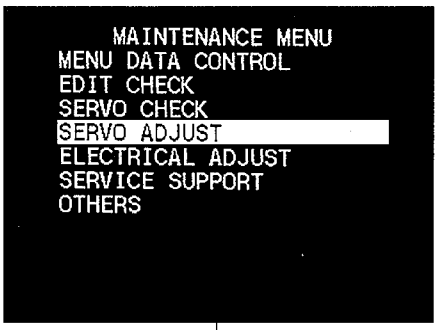
11. When the adjustment is complete, the alignment tape is automatically ejected.
12. Press the [←] key twice and the monitor screen returns to the display ①.
13. Execute "SAVE ADJUSTING DATA" of the "SAVE/LOAD CONTROL" and press [YES] key to save the adjustment data.
14. Press the [MENU] key to return to the maintenance menu.



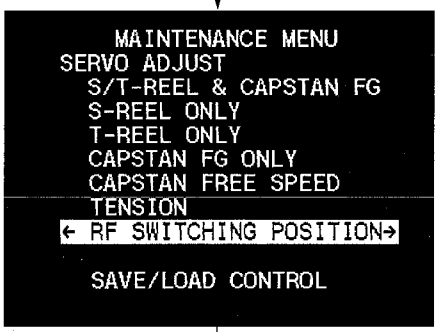
[MANUAL Adjustment]

1. Set the switch S801/RP-90 board to No. 0.
   Connect an oscilloscope as follows:
   CH-1 : TP804/RP-90 board (D-1)
   CH-2 : TP801/RP-90 board (C-1)
   TRIG : CH-2

2. Show the maintenance menu on the monitor screen.
   (1) While pressing the [←] key on the sub control panel, press the [MENU] key to show the maintenance menu.
3. Press the [↑], [↓] keys and select "SERVO ADJUST".

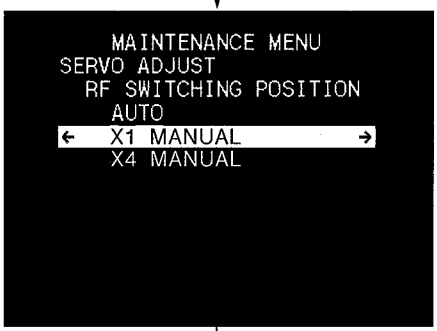


4. Press the [→] key to show the display ①.
5. Press the [↑], [↓] keys and select "RF SWITCHING POSITION".



①

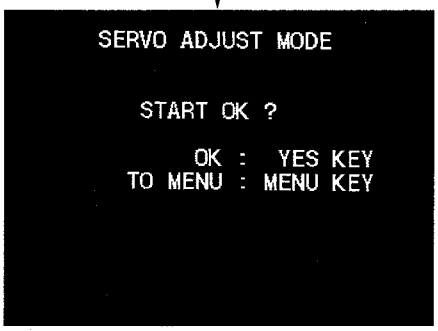
6. Press the [→] key to show the display ②.
7. Press the [↑], [↓] keys and select "X1 MANUAL", and perform the step 8 and later.



②

- **After completing the "X1 MANUAL" adjustment, select "X4 MANUAL".**

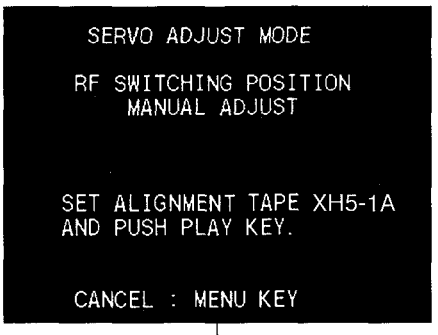
8. Press the [→] key to show the display ③ "START OK?".
9. Press the [YES] key.



③

10. Playback the alignment tape XH5-1A2.
    Then the unit starts the RF switching position automatic adjustment.

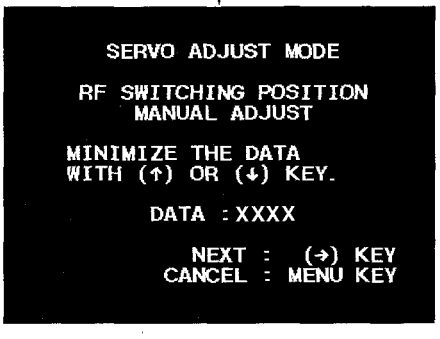
④



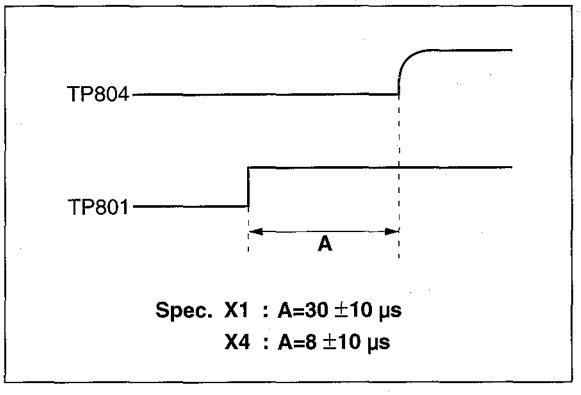
11. Press the [↑], [↓] keys until the RF switching position satisfies the specification.

    Specification : X1 : FFEC to 0014 (center : 0000)
    X4 : FFFB to 0005 (center : 0000)

⑤

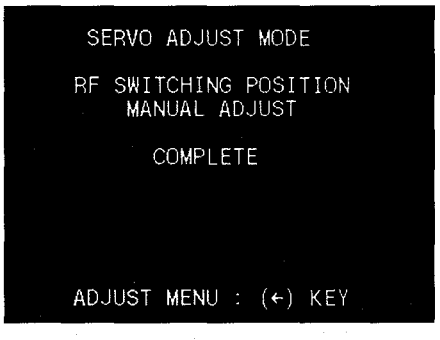


Note : When the displayed data does not change or does not stabilize, perform the coarse adjustment using the [↑], [↓] keys then perform the step 11 again.



12. Press the [→] key to show the display ⑥.
13. When the adjustment is complete, the display ⑥ "COMPLETE" appears.
14. When the adjustment is complete, the alignment tape is automatically ejected.
15. Press the [←] key to show the display ②, and select "X4 MANUAL". Adjust the switching position to satisfy the specification according to step 8 to 11. And then, perform steps 12 and 13.
16. Press the [←] key twice and the monitor screen returns to the display ①.
17. Execute "SAVE ADJUSTING DATA" of the "SAVE/LOAD CONTROL" to save the adjustment data.
18. Press the [MENU] key to return to the maintenance menu.

⑥



SECTION 8
ELECTRICAL ALIGNMENT (for NTSC)

8-1. ELECTRICAL ALIGNMENT OVERVIEW (for NTSC)

8-1-1. List of Adjustment Parts

AU-238

RV400 CH-1 PB Level ..... 8-3 (N)
RV460 CH-2 PB Level ..... 8-3 (N)
RV520 CH-3 PB Level ..... 8-3 (N)
RV580 CH-4 PB Level ..... 8-3 (N)

DDE-4

CV300 Composite 4Fsc PLL DC ..... 8-21 (N)
CV601 SPCK Error ..... 8-20 (N)
RV100 REC A/D Y Level ..... 8-25 (N)
RV102 REC S VIDEO Chroma Level ..... 8-27 (N)
RV200 REC Composite Y Level ..... 8-26 (N)
RV201 REC Composite Chroma Level ..... 8-27 (N)
RV202 REC Composite Chroma Level ..... 8-27 (N)
RV300 Composite 4Fsc PLL DC ..... 8-21 (N)
RV301 Composite SCH Detect ..... 8-33 (N)
RV400 REC Y Level ..... 8-23 (N)
RV401 REC Component B-Y Level ..... 8-24 (N)
RV402 REC Component R-Y Level ..... 8-24 (N)
RV403 REC Y Clamp Level ..... 8-22 (N)
RV404 REC Composite Y/B-Y Delay ..... 8-28, 8-29 (N)
RV405 REC S VIDEO Y/B-Y Delay ..... 8-31, 8-32 (N)
RV406 REC Component Y/B-Y Delay ..... 8-30 (N)
RV407 REC Composite Y/R-Y Delay ..... 8-28, 8-29 (N)
RV408 REC S VIDEO Y/R-Y Delay ..... 8-31, 8-32 (N)
RV409 REC Component Y/R-Y Delay ..... 8-30 (N)

DEN-5

CV100 INT SC Frequency ..... 8-5 (N)
CV101 HCK ..... 8-5 (N)
RV100 REF. Internal SCH Phase ..... 8-19 (N)
RV101 REF. OUT Sync Level ..... 8-19 (N)
RV102 REF. VIDEO OUT Burst Level ..... 8-19 (N)
RV103 ENC V (R-Y) Phase ..... 8-11 (N)
RV104 ENC U (B-Y) Phase ..... 8-11 (N)
RV105 PB INT SCH Phase ..... 8-16 (N)
RV106 REF. CF Phase ..... 8-17 (N)
RV200 S VIDEO OUT Y Level ..... 8-8 (N)
RV201 PB S VIDEO Chroma Level ..... 8-13 (N)
RV301 PB Composite Y/C Delay ..... 8-14 (N)
RV302 PB Composite C/C Delay ..... 8-13 (N)
RV400 VIDEO OUT 1 Y Level ..... 8-8 (N)
RV401 VIDEO OUT 2 Y Level ..... 8-9 (N)
RV402 VIDEO OUT Sync Level ..... 8-8 (N)
RV403 ENC V SC Leak ..... 8-10 (N)
RV404 ENC U SC Leak ..... 8-10 (N)
RV405 ENC R-Y Level ..... 8-12 (N)
RV406 ENC B-Y Level ..... 8-12 (N)
RV407 PB Burst Level ..... 8-12 (N)
RV500 COMPONENT Y OUT Level ..... 8-6 (N)
RV501 COMPONENT B-Y OUT Level ..... 8-6 (N)
RV502 COMPONENT R-Y OUT Level ..... 8-7 (N)
RV503 Setup off Chroma Level ..... 8-7 (N)
RV504 COMPONENT Y Sync Level ..... 8-6 (N)
RV505 PB COMPONENT Y/B-Y Delay ..... 8-15 (N)
RV506 PB COMPONENT Y/R-Y Delay ..... 8-15 (N)

SY-220

CV101 Character Position ..... 8-3 (N)

8-1-2. Measuring Equipment and Tools

Type of measuring equipment	Equivalent	Remarks
Oscilloscope	Tektronix 2445	150 MHz or more
Video signal generator	TSG-130A (Op.02)	
Waveform monitor	Tektronix 1760 Op. SC/1765 Op. SC	
Audio signal generator	HP339A	
Audio level meter	HP3400A/MeguroMN-446	
Frequency counter	Advantest TR5821	
Extension board	DJ-156 (J-6441-560-A)	
	DJ-157 (J-6441-570-A)	
Blank tape	DVM30ME, DVM30NME	On the market

8-1-3. Reference Tape for Alignment

XH5-1A2 (8-967-999-22)
Recording contents are followings.

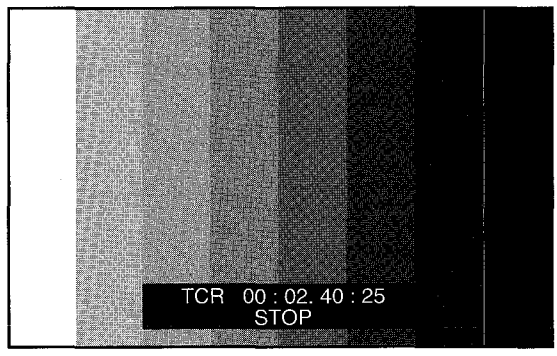
VIDEO	TIME CODE (h) (m) (s)	REC (s)	AUDIO		
Black Burst	23 : 59 : 00	60	No Signal		32 kHz 4 ch
75 % Full Color Bars	00 : 00	60	1 kHz		
60 % Multi Burst	01 : 00	60	20 Hz		
Bowtie with Mod 12.5T	02 : 00	30	14.5 kHz		
Shallow Ramp	02 : 30	30	10 kHz		
	03 : 00	30	No Signal		
Cross Hatch (index)	03 : 30	30	1 kHz 0 dBFS		
Line 17	04 : 00	40	1 ch	1 kHz	
75 % Full Color Bars	04 : 40	40	2 ch		
Quad Phase	05 : 20	40	3 ch		
	06 : 00	40	4 ch		
Black Burst	06 : 40	5	No Signal		
	06 : 45	5			48 kHz 2 ch
60 % Multi Burst (for Composite)	06 : 50	60	1 kHz		
Mod 12.5T	07 : 50	30	20 Hz		
Shallow Ramp (B-Y/R-Y OFF)	08 : 20	30	20 kHz		
	08 : 50	30	10 kHz		
Cross Hatch (index)	09 : 20	30	1 kHz 0 dBFS		
Chroma Noise	09 : 50	30	1 kHz		
Line 17	10 : 20	30			
75 % Full Color Bars	10 : 50	180			
60 % Multi Burst	13 : 50	60			
Mod 12.5T	14 : 50	30			
Shallow Ramp	15 : 20	60			
75 % Full Color Bars	16 : 20	100			
75 % Full Color Bars (R-Y OFF)	18 : 00	180			
75 % Full Color Bars (B-Y OFF)	21 : 00	180			
Blanking Marker	24 : 00	180			
Line 17 (R-Y OFF)	27 : 00	180			
Line 17 (B-Y OFF)	30 : 00	180			

*** Audio levels are –20 dBFS (Reference), except 1 kHz 0 dBFS part.**

8-2. ADJUSTMENT PROCEDURE (for NTSC)

8-2-1. System / Audio Adjustment

8-2-1-1. Character Position Adjustment

Conditions for adjustment	Adjustment • Specification
• CHARACTER : ON • EE mode • VIDEO IN : 75 % Color bars	VIDEO 2 (SUPER) OUT (75 Ω terminated) ⊘**CV101**/SY-220 (F-3)  **Spec. Adjust the character position with a good balance with respect to color bars.**

8-2-1-2. AUDIO PB Level Adjustment

Conditions for adjustment	Adjustment • Specification
• MENU ENHANCED ↓ AUDIO CONTROL ↓ REF LEVEL ; –20 dB • Switch S400 (M-2) S460 (M-1) S520 (M-4) S580 (M-3) } 1, 2 → OFF • PB mode 1 kHz REF. Level (32 kHz, 4ch) /XH5-1A2	*AUDIO OUT CH-1 to 4 (600 Ω loaded)* CH-1⊘**RV400**/AU-238 (L-1) CH-2⊘**RV460**/AU-238 (M-1) CH-3⊘**RV520**/AU-238 (L-1) CH-4⊘**RV580**/AU-238 (L-1) **Spec. +4.0 ±0.1 dBu**

8-2-2. Video Adjustment

[Switch Setting]

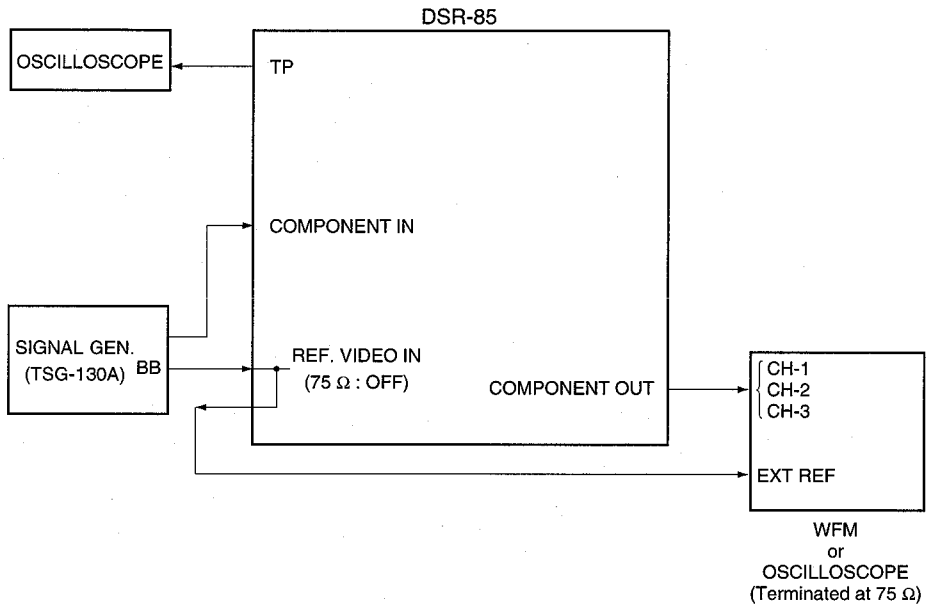
This setting should be fixed in position unless otherwise specified.

LOCAL/REMOTE ; LOCAL
CHARACTER ; ON
SETUP REMOVER ; OFF
SETUP ADDER ; OFF

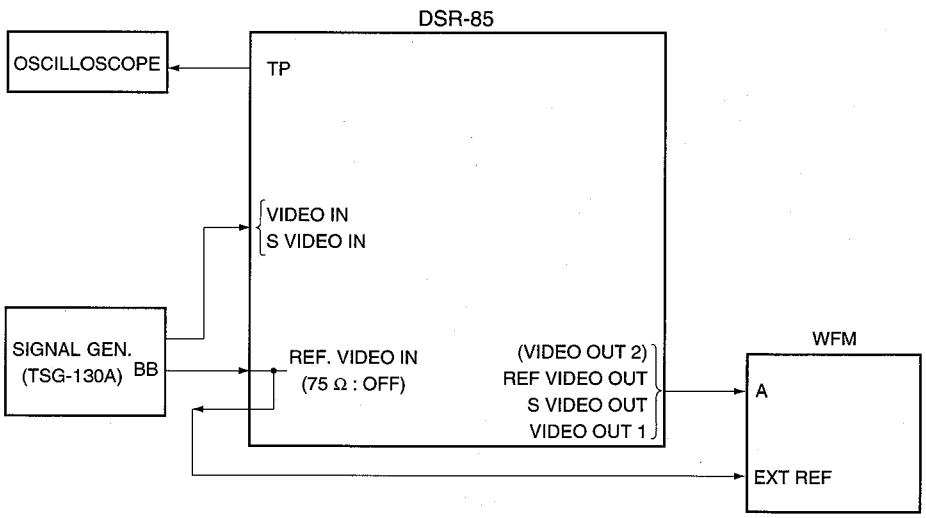
[Connection]

Connect some equipment as following unless otherwise specified.

(Connection 1)

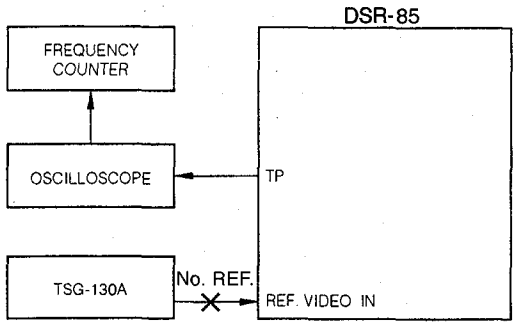


(Connection 2)



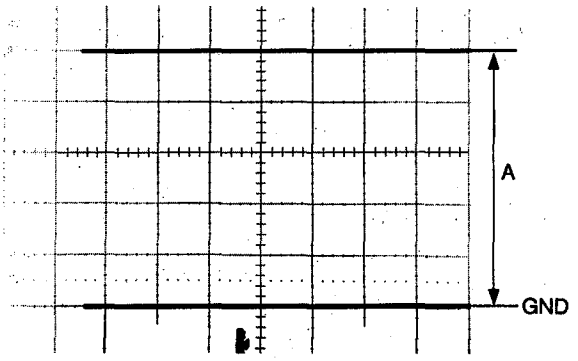
8-2-2-1. INT SC Frequency Adjustment

(Connection)

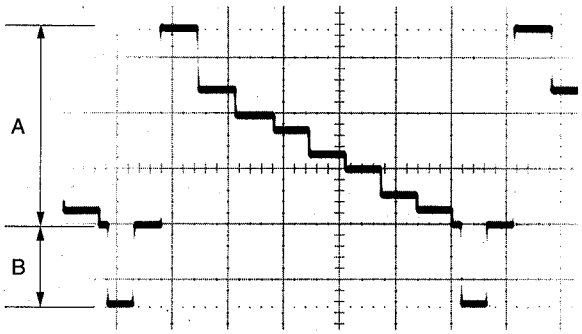


Conditions for adjustment	Adjustment • Specification
• STOP mode • REF. VIDEO IN ; No signal	TP102/DEN-5 (N-3) ⊘**CV100**/DEN-5 (N-1) Frequency counter **Spec. f=3,579,545 ±10 Hz**

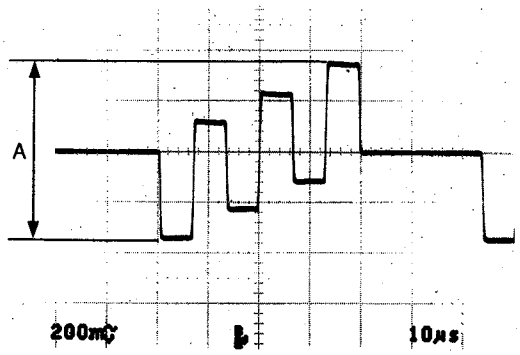
8-2-2-2. HCK Adjustment

Conditions for adjustment	Adjustment • Specification
• STOP mode Connection 1	TP103/DEN-5 (N-2) ⊘**CV101**/DEN-5 (N-2) Oscilloscope  **Spec. A=2.50 ±0.05 Vdc**

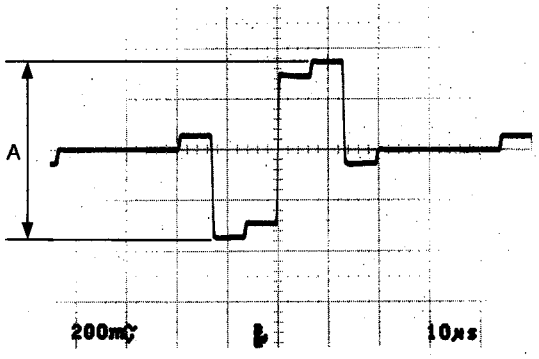
8-2-2-3. COMPONENT Y OUT Level Adjustment

Conditions for adjustment	Adjustment • Specification
• SETUP MENU/VIDEO CONTROL/SETUP ADDER ; ON • PB mode 75 % Color bars/XH5-1A2 Connection 1	COMPONENT Y OUT (75 Ω terminated) (A) Y Level ⊘**RV500**/DEN-5 (F-1) (B) Y/S-Y SYNC ⊘**RV504**/DEN-5 (H-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.714 ±0.007 V (100 ±1 IRE)** **B=0.286 ±0.003 V (40 ±0.5 IRE)**

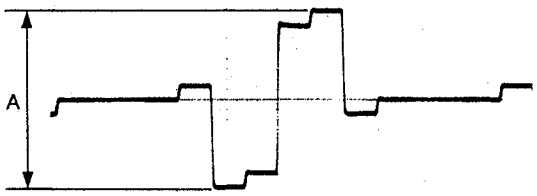
8-2-2-4. COMPONENT B-Y OUT Level Adjustment

Conditions for adjustment	Adjustment • Specification
• SETUP MENU/VIDEO CONTROL/SETUP ADDER ; ON • PB mode 75 % Color bars/XH5-1A2 Connection 1	COMPONENT B-Y OUT (75 Ω terminated) ⊘**RV501**/DEN-5 (F-1) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V (98 ±1 IRE)**

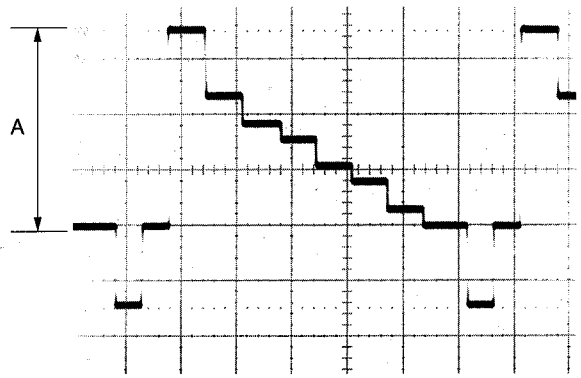
8-2-2-5. COMPONENT R-Y OUT Level Adjustment

Conditions for adjustment	Adjustment • Specification
• SETUP MENU/VIDEO CONTROL/SETUP ADDER ; ON • PB mode 75 % Color bars/XH5-1A2 Connection 1	COMPONENT R-Y OUT (75 Ω terminated) ⊘**RV502**/DEN-5 (E-1) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V (98 ±1 IRE)**

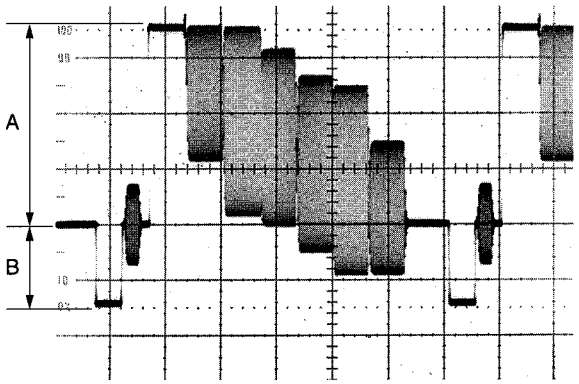
8-2-2-6. Setup off Chroma Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 **Note : SETUP MENU/VIDEO CONTROL/SETUP ADDER ; OFF** Connection 1	COMPONENT R-Y OUT (75 Ω terminated) ⊘**RV503**/DEN-5 (E-1) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.757 ±0.007 V (106 ±1 IRE)**

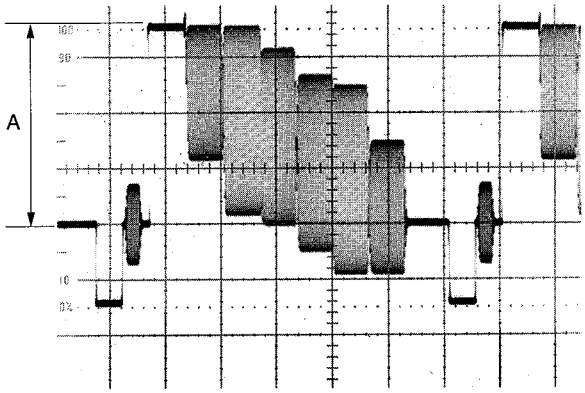
8-2-2-7. S VIDEO OUT Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 Connection 2	S VIDEO (Y) OUT (75 Ω terminated) ⊘**RV200**/DEN-5 (H-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.714 ±0.007 V (100 ±1 IRE)**

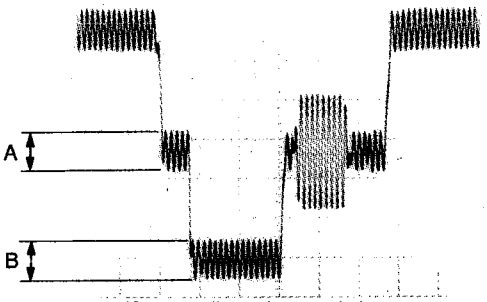
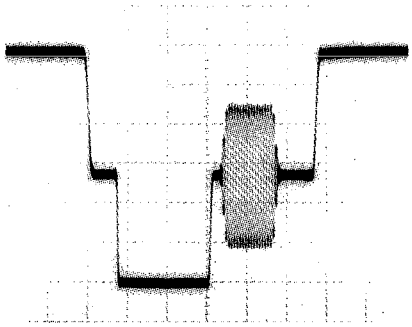
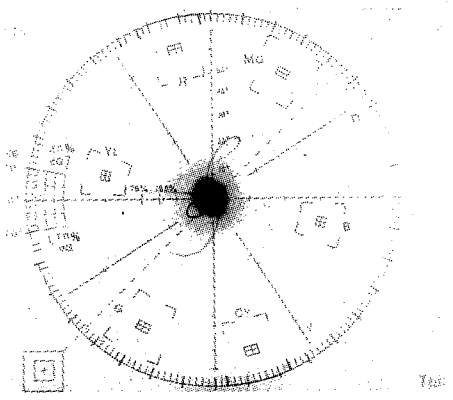
8-2-2-8. VIDEO OUT 1 Y/SYNC Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Video Level ⊘**RV400**/DEN-5 (G-4) (B) Sync Level ⊘**RV402**/DEN-5 (H-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.714 ±0.007 V (100 ±1 IRE)** **B=0.286 ±0.003 V (40 ±0.5 IRE)**

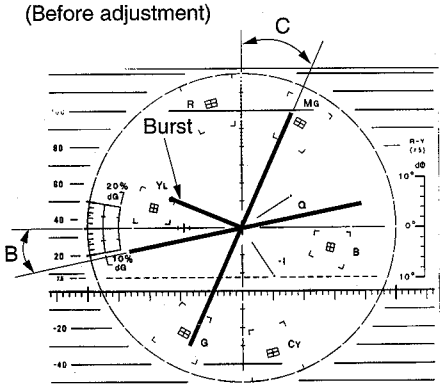
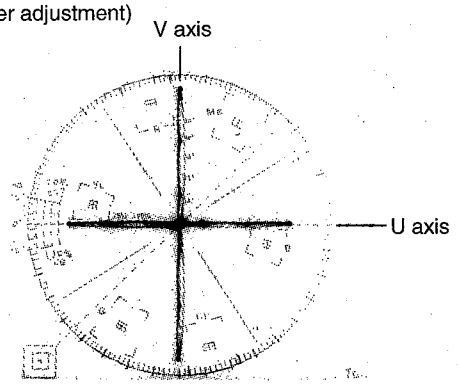
8-2-2-9. VIDEO OUT 2 Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 Connection 2	VIDEO OUT 2 (75 Ω terminated) ⊘**RV401**/DEN-5 (H-4) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.714 ±0.007 V (100 ±1 IRE)**

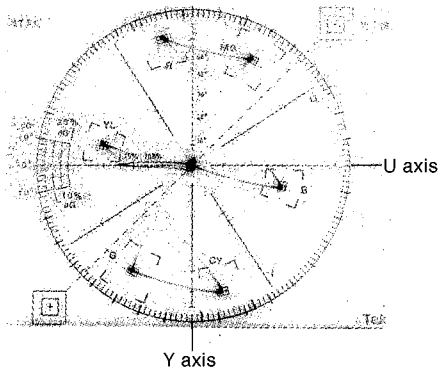
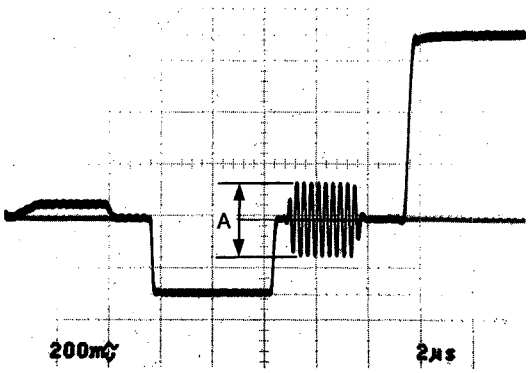
8-2-2-10. ENC SC Leak Adjustment

Conditions for adjustment	Adjustment • Specification
Step 1 • PB mode 75 % Color bars/XH5-1A2 • Set the time axis of the WFM to magnification mode Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) V SC Leak ⊘**RV403**/DEN-5 (H-1) (B) U SC Leak ⊘**RV404**/DEN-5 (H-1) TRIG : REF. VIDEO WFM Before adjustment  (Spec. Adjust alternately.) ⇩ After adjustment  **Spec. Minimize the A, B. A, B≦0.007 V (1 IRE)**
Step 2 (Check) • PB mode 75 % Color bars/XH5-1A2 Connection 2	VIDEO OUT 1 (75 Ω terminated) TRIG : REF. VIDEO Vector  **Spec. Maximum the gain of the Vector and check the dot is at center.**

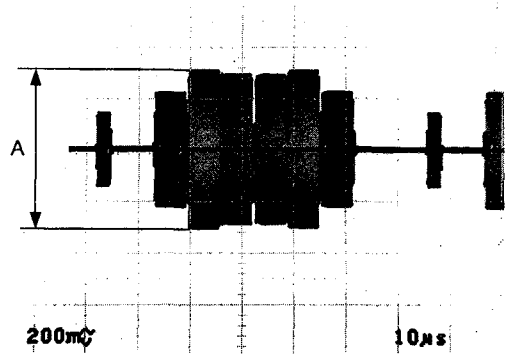
8-2-2-11. U-V Axis (B-Y, R-Y) Phase Adjustment

Conditions for adjustment	Adjustment • Specification
[Flow] (A) Burst preset • PB mode Quad Phase/XH5-1A2 (05:20-06:00) (B) U-axis phase adjustment • PB mode Quad Phase/XH5-1A2 (05:20-06:00) (C) V-axis phase adjustment • PB mode Quad Phase/XH5-1A2 (05:20-06:00) Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Burst preset ⊘**PHASE control**/Vector (B) U-axis (HUE) ⊘**RV104**/DEN-5 (N-1) (C) V-axis (U/V OFFSET) ⊘**RV103**/DEN-5 (N-1) TRIG : REF. VIDEO Vector (Before adjustment)  ⇩ (After adjustment)  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) Set the dots of the B-Y on the U axis of the vector.** **(C) Set the dots of the R-Y on the V axis of the vector.** **B, C=0 ±0.5 °**

8-2-2-12. PB VIDEO OUT 1 Chroma/Burst Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 **Note : The "Setup ON/OFF" setting of the DSR-85 and that a vectorscope must have been set to the same position beforehand.**	VIDEO OUT 1 (75 Ω terminated) Step 1 C level (A) Burst ●**PHASE control**/Vector (B) ENC R-Y Level ●**RV405**/DEN-5 (H-1) ENC B-Y Level ●**RV406**/DEN-5 (H-1) TRIG : REF. VIDEO Vector  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) All dots should be inside the "⊞" mark on the vector by adjustment RV405 and RV406 alternately.**
	Step 2 Burst level ●**RV-407**/DEN-5 (J-1) TRIG : REF. VIDEO WFM or Oscilloscope 
Connection 2	**Spec. A=0.286 ±0.003 V (40 ±0.5 IRE)**

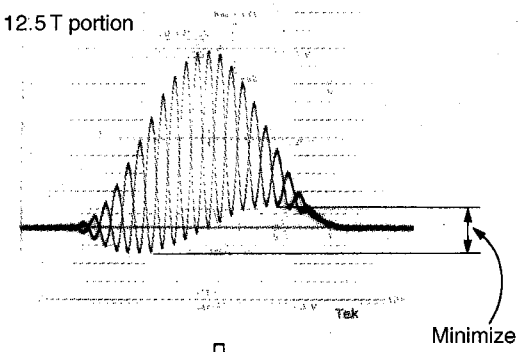
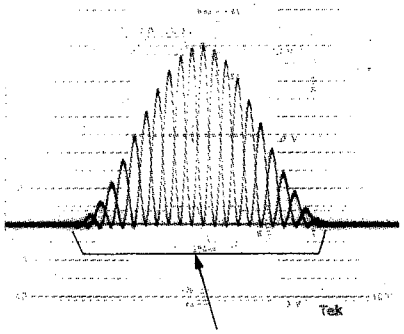
8-2-2-13. PB S VIDEO Chroma Level Adjustment

Conditions for adjustment	Adjustment • Specification
• SETUP MENU/ VIDEO CONTROL/SETUP ADDER ; ON • PB mode 75 % Color bars/XH5-1A2 Connection 2	S VIDEO (C) OUT (75 Ω terminated) ⊘**RV201**/DEN-5 (K-1) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.627 ±0.007 V (87.7 ±1 IRE)**

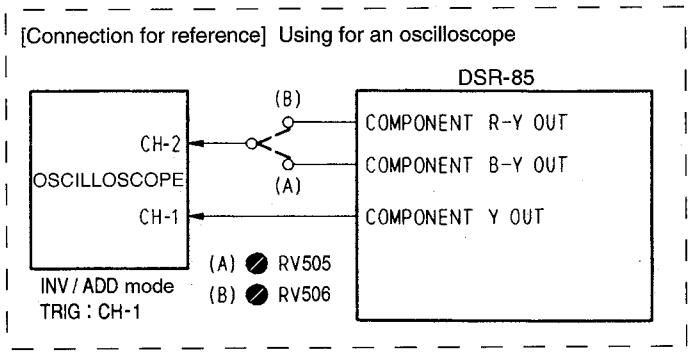
8-2-2-14. PB Composite C/C Delay Adjustment

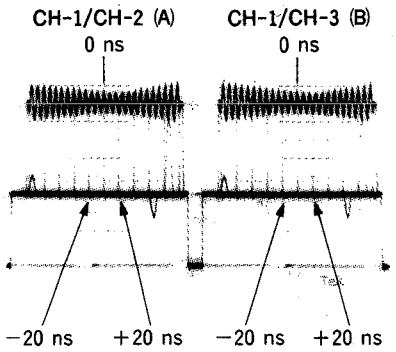
Conditions for adjustment	Adjustment • Specification
• PB mode Bowtie/XH5-1A2 (02:00-02:30) Connection 2	CH-1/Oscilloscope TP301/DEN-5 (F-2) ⊘**RV302**/DEN-5 (B-1) CH-2/Oscilloscope TP302/DEN-5 (F-3) Oscilloscope Vertical mode : INV +ADD **Spec.** Minimize

8-2-2-15. PB Composite Y/C Delay Adjustment

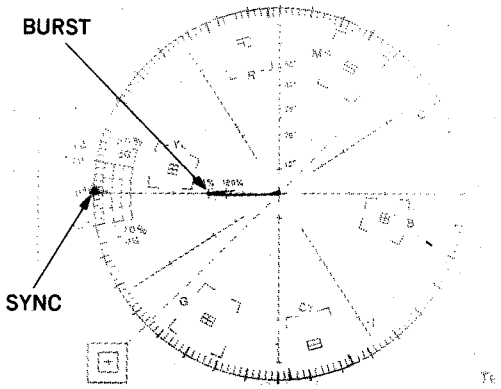
Conditions for adjustment	Adjustment • Specification
• PB mode Mod 12.5T/XH5-1A2 (07:50-08:20) Connection 2	VIDEO OUT 1 (75 Ω terminated) ⊘**RV301**/DEN-5 (B-1) TRIG : INT/WFM WFM Before adjustment 12.5 T portion  Minimize ⇩ After adjustment  **Spec.** Flat

8-2-2-16. PB Component Y/C Delay Adjustment



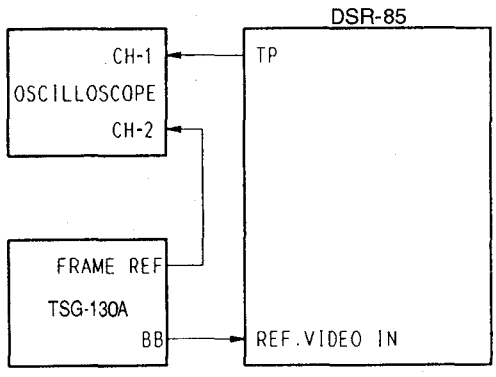
Conditions for adjustment	Adjustment • Specification
• PB mode Bowtie/XH5-1A2 (02:00-02:30) Connection 1	COMPONENT OUT (75 Ω terminated) (A) B-Y Delay **RV505**/DEN-5 (F-1) (B) R-Y Delay **RV506**/DEN-5 (G-1) TRIG : EXT/WFM Bowtie mode  **Spec. Set the each Bowtie dip point of (A) and (B) on the center marker.** **0 ±20 ns**

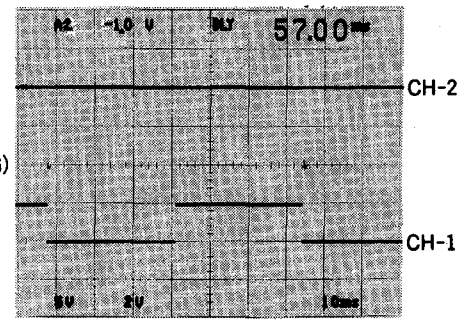
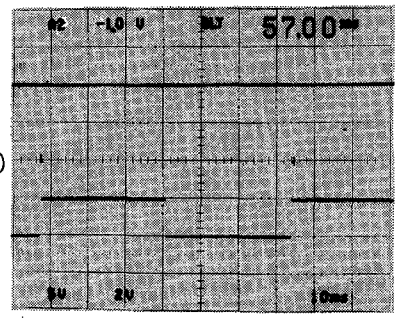
8-2-2-17. PB INT SCH Phase Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 • REF. VIDEO IN ; No signal • After adjustment, connect REF. VIDEO IN. Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Burst Preset ⊘**PHASE control**/Vector (B) INT SC ⊘**RV105**/DEN-5 (N-1) TRIG : INT/WFM SCH mode  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) The SYNC should be in the same phase as the burst (SCH=0 °).**

8-2-2-18. REF. CF Phase Adjustment

(Connection)



Conditions for adjustment	Adjustment • Specification
• EJECT mode	CH-1/Oscilloscope TP105/DEN-5 (K-1) ⊘**RV106**/DEN-5 (K-1) CH-2/Oscilloscope FRAME PULSE/TSG-130A TRIG : FRAME PULSE (CH-2) Oscilloscope (NG)  CH-2 CH-1 ⇩ (OK)  CH-2 CH-1

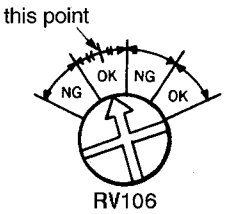
Spec. (1) Turn RV106 counterclockwise fully.

(2) When RV106 is turned clockwise gradually, the phase condition between CH-1 and CH-2 changes from NG to OK or OK to NG.

(3) In case of the pattern of change is started from NG as shown in the following illustration, set RV106 to mechanical center of range of first OK.

NG → OK → NG → OK

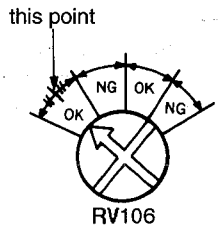
the mechanical center of this range



(4) In case of the pattern of change is started from OK as shown in the following illustration, set RV106 to mechanical center of range of first OK.

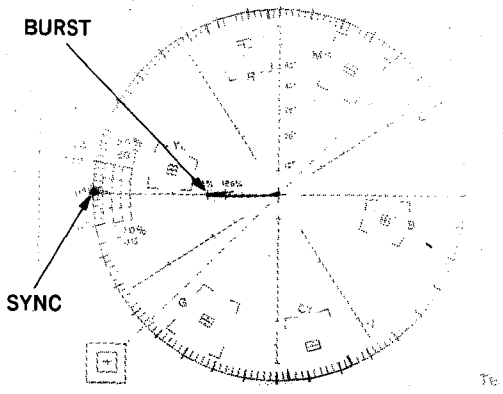
OK → NG → OK → NG

the mechanical center of this range

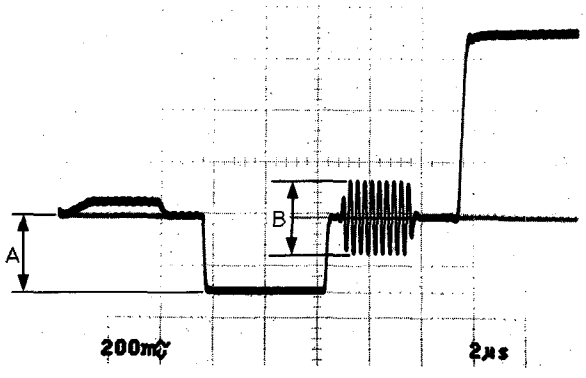


* If the range of first OK is extremely narrow, set to mechanical center of range of second OK.

8-2-2-19. REF. Internal SCH Phase Adjustment

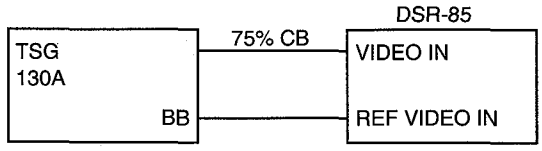
Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 • REF. VIDEO IN ; No signal • After adjustment is completed, re-connect the REF. VIDEO IN. Connection 2	REF. VIDEO OUT (75 Ω terminated) (A) Burst Preset **⊘PHASE control**/Vector (B) Sync Phase **⊘RV100**/DEN-5 (K-1) TRIG : INT/WFM SCH mode  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) The SYNC should be in the same phase as the burst.** **(SCH=0 ±3 °)**

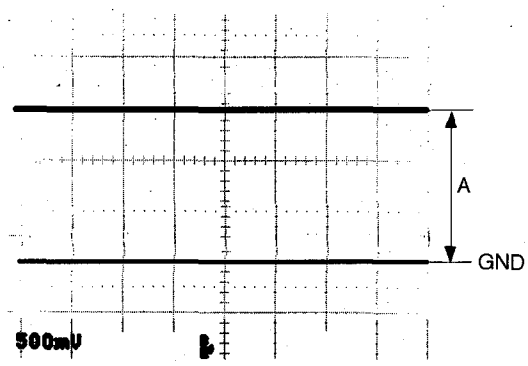
8-2-2-20. REF. VIDEO OUT Sync/Burst Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 Connection 2	REF. VIDEO OUT (75 Ω terminated) (A) Sync Level **⊘RV101**/DEN-5 (K-4) (B) Burst Level **⊘RV102**/DEN-5 (K-4) TRIG : INT/WFM WFM or Oscilloscope  **Spec. A, B=0.286 ±0.003 V (40 ±0.5 IRE)**

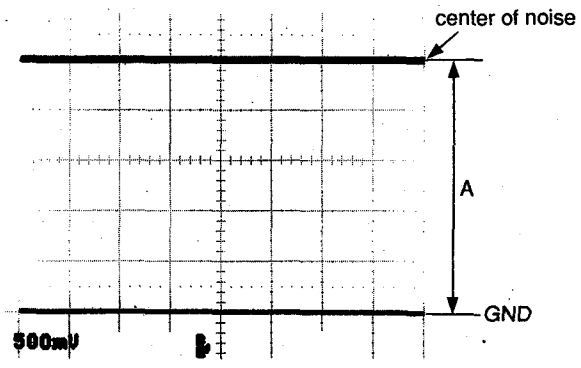
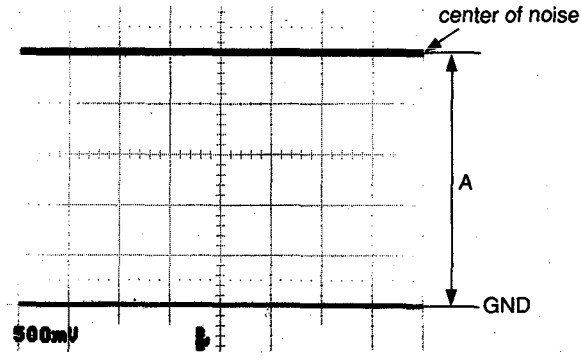
8-2-2-21. SPCK Error Adjustment

(Connection)

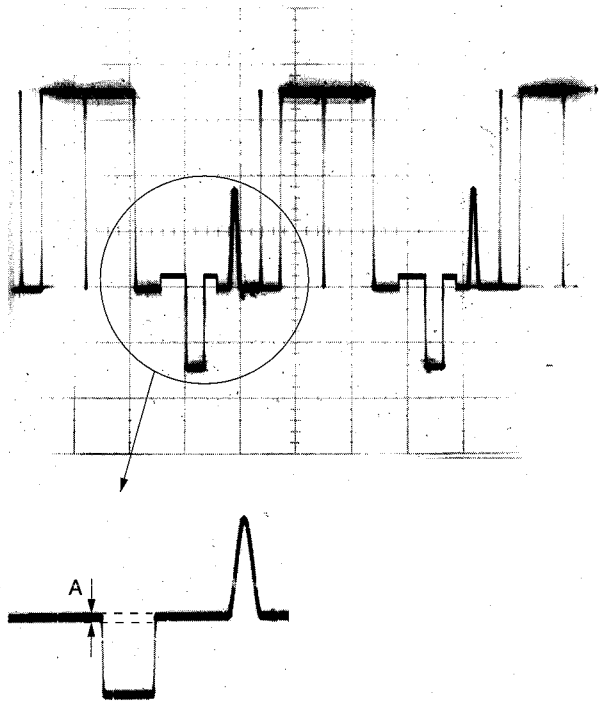


Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 75 % Color bars	TP601/DDE-4 (B-2) ⊘**CV601**/DDE-4 (B-3) Oscilloscope  **Spec. A=1.5 ±0.1 Vdc**

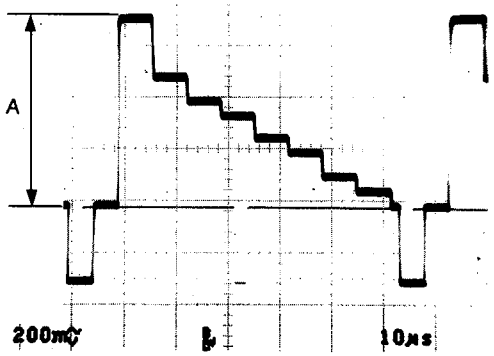
8-2-2-22. Composite 4Fsc PLL DC Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 75 % Color bars • VIDEO IN select/Front panel ; COMPOSITE	TP301/DDE-4 (L-1) ⊘**CV300**/DDE-4 (L-1) *Oscilloscope*  **Spec. A=2.50 ±0.05 Vdc**
	TP300/DDE-4 (J-1) ⊘**RV300**/DDE-4 (J-2) Oscilloscope  **Spec. A=2.50 ±0.05 Vdc**
Connection 2	

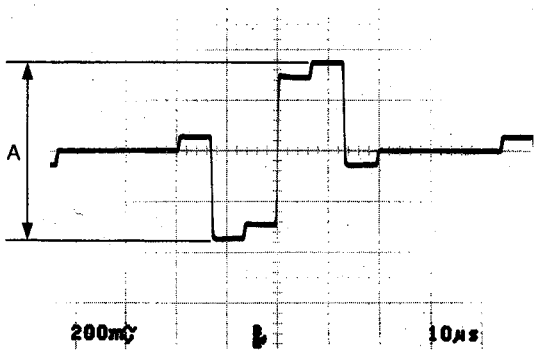
8-2-2-23. REC Y Clamp Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • COMPONENT IN ; Pulse & Bar **Note : SETUP MENU/VIDEO CONTROL/SETUP REMOVE ; OFF**	COMPONENT Y OUT (75 Ω terminated) **RV403**/DDE-4 (J-3) WFM or Oscilloscope  **Spec. A=Minimize the level difference A at setup.**
Connection 1	

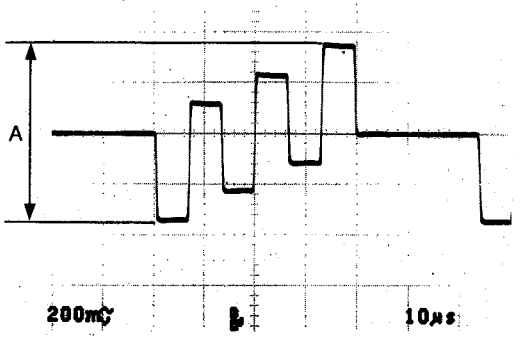
8-2-2-24. REC Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • COMPONENT IN ; 75 % Color bars Connection 1	COMPONENT Y OUT (75 Ω terminated) ⊘**RV400**/DDE-4 (J-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec.** A=0.714 ±0.007 V (100 ±1 IRE)

8-2-2-25. REC Component R-Y Level Adjustment

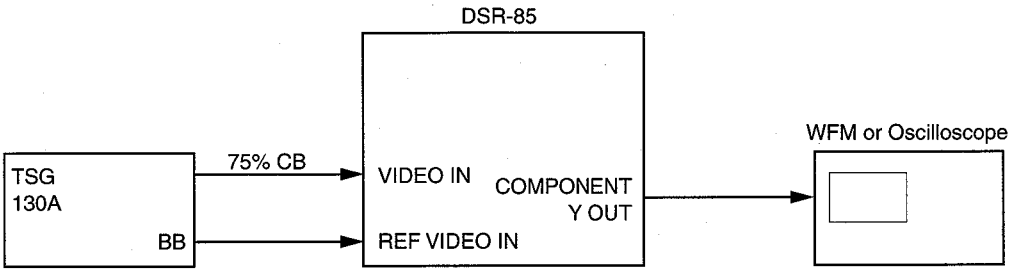
Conditions for adjustment	Adjustment • Specification
• EE mode • COMPONENT IN ; 75 % Color bars Connection 1	COMPONENT R-Y OUT (75 Ω terminated) ⊘**RV402**/DDE-4 (J-4) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V (98 ±1 IRE)**

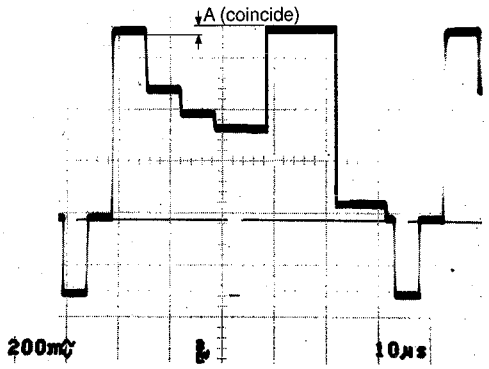
8-2-2-26. REC Component B-Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • COMPONENT IN ; 75 % Color bars Connection 1	COMPONENT B-Y OUT (75 Ω terminated) ⊘**RV401**/DDE-4 (J-5) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V (98 ±1 IRE)**

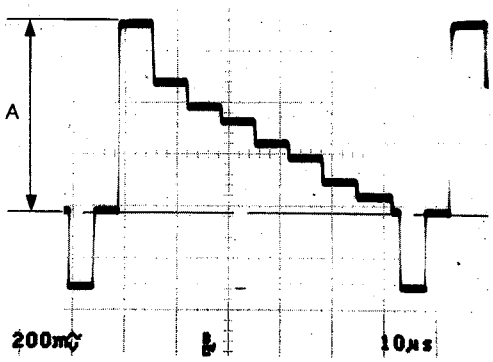
8-2-2-27. REC A/D Y Level Adjustment

(Connection)

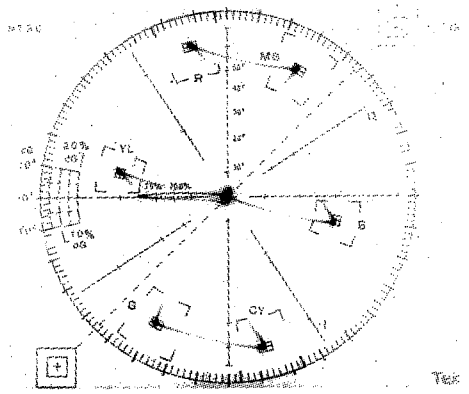


Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 75 % Color bars • VIDEO IN select/Front panel ; COMPOSITE • S501-1/SY-220 (M-1) ; ON • S200/DDE-4 (N-1) ; ON	COMPONENT Y OUT (75 Ω terminated) **RV100**/DDE-4 (N-3) TRIG : REF. VIDEO WFM or Oscilloscope 
• After Adjustment, S501-1, S200 ; OFF	**Spec. A=0 ±0.007 V (0 ±1 IRE)**

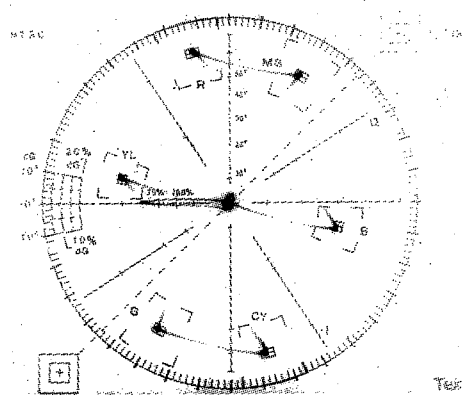
8-2-2-28. REC Composite Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 75 % Color bars • VIDEO IN select/Front panel ; COMPOSITE Connection 2	VIDEO OUT 1 (75 Ω terminated) ●**RV200**/DDE-4 (M-4) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.714 ±0.007 V (100 ±1 IRE)**

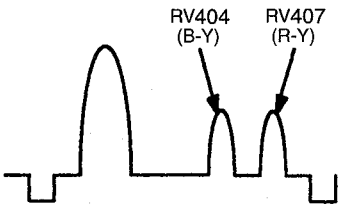
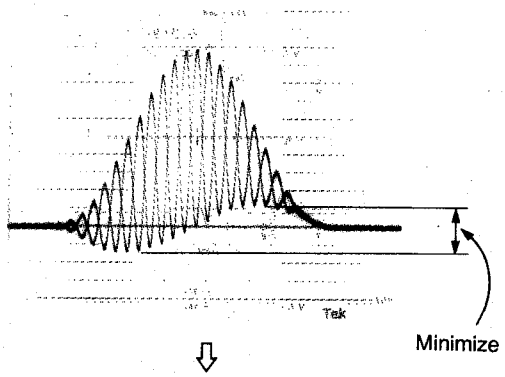
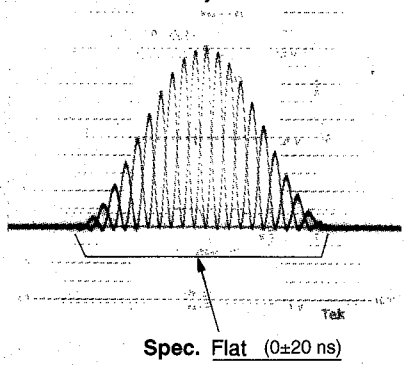
8-2-2-29. REC Composite Chroma Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 75 % Color bars • VIDEO IN select/Front panel ; COMPOSITE **Note : The "Setup ON/OFF" setting of the DSR-85 and that a vectorscope must have been set to the same position beforehand.** Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Burst **⊘PHASE control**/Vector (B) Composite Chroma Level **⊘RV201**/DDE-4 (M-4) **⊘RV202**/DDE-4 (M-4) TRIG : REF. VIDEO Vector  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) All dots should be inside the "⊞" mark on the vector.**

8-2-2-30. REC S VIDEO Chroma Level Adjustment

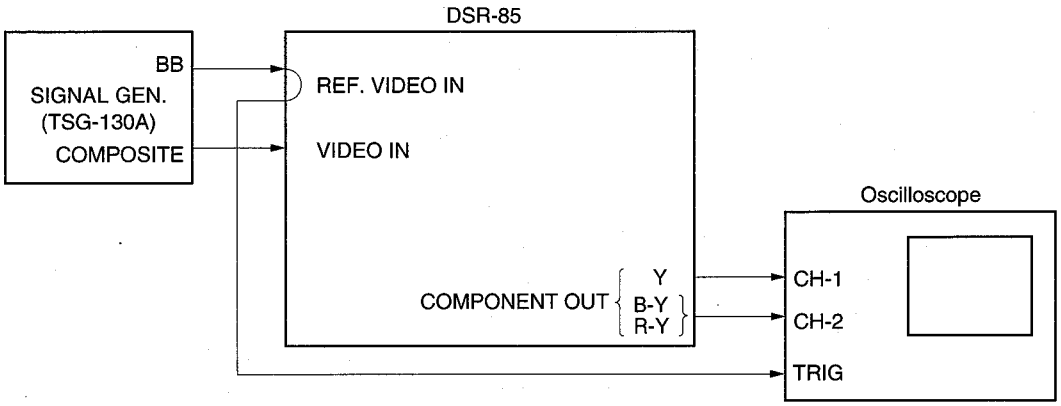
Conditions for adjustment	Adjustment • Specification
• EE mode • S VIDEO IN ; 75 % Color bars • VIDEO IN select/Front panel ; S VIDEO **Note : The "Setup ON/OFF" setting of the DSR-85 and that a vectorscope must have been set to the same position beforehand.** Connection 2	S VIDEO (C) OUT (75 Ω terminated) (A) Burst **⊘PHASE control**/Vector (B) S-C Level **⊘RV102**/DDE-4 (P-4) TRIG : REF. VIDEO Vector  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) All dots should be inside the "⊞" mark on the vector.**

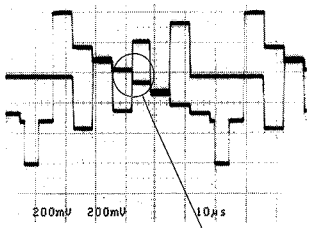
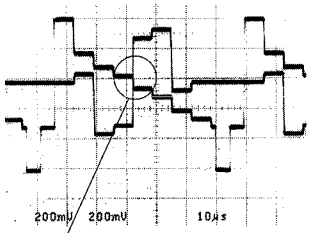
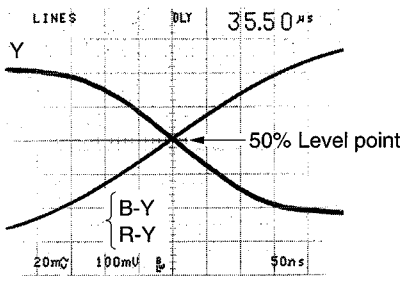
8-2-2-31. REC Composite Y/C Delay Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; Bowtie (with Mod 12.5T) • VIDEO IN switch/Front panel ; COMPOSITE Connection 2	VIDEO OUT 1 (75 Ω terminated) B-Y : ⊘**RV404**/DDE-4 (K-5) R-Y : ⊘**RV407**/DDE-4 (K-4)  TRIG : EXT/WFM WFM Before adjustment  ⇩ After adjustment 

When the Composite Bowtie (with Mod 12.5T) Signal is not Available

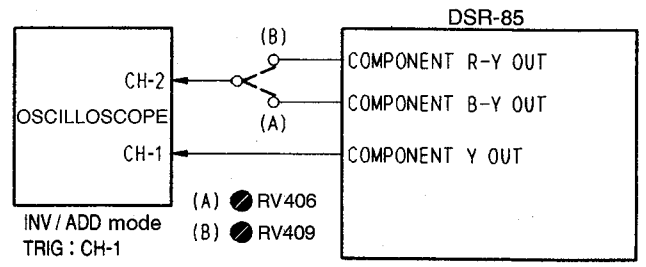
(Connection)

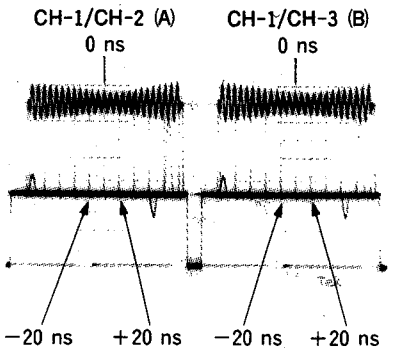


Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 75 % Color bars • VIDEO IN select/Front panel ; COMPOSITE	COMPONENT OUT (75 Ω terminated) B-Y : ⊘**RV404**/DDE-4 (K-5)  R-Y : ⊘**RV407**/DDE-4 (K-4)   **Spec. 0 ±20 ns**

8-2-2-32. REC Component Y/C Delay Adjustment

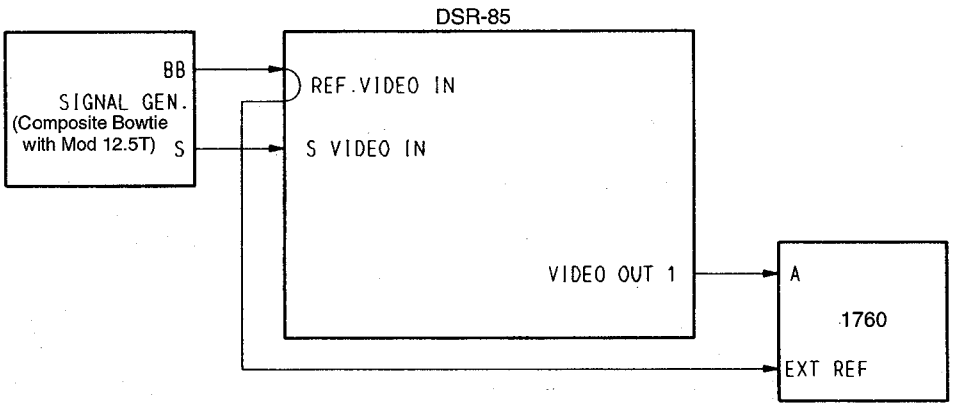
[Connection for reference] Using for an oscilloscope

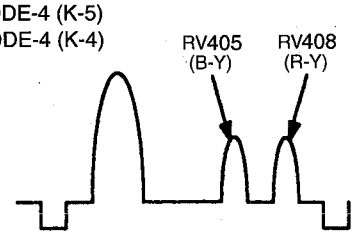
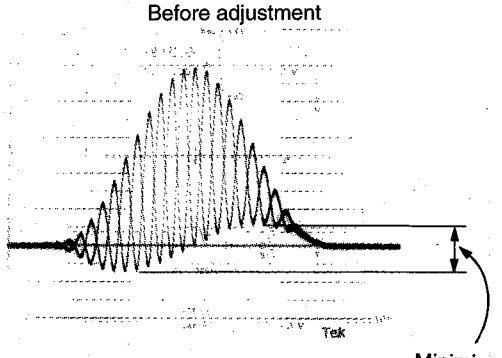
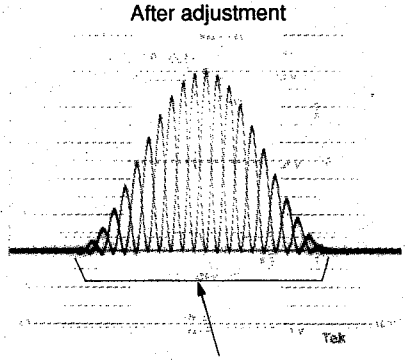


Conditions for adjustment	Adjustment • Specification
• EE mode • COMPONENT IN ; Bowtie Connection 1	COMPONENT OUT (75 Ω terminated) (A) B-Y Delay **RV406**/DDE-4 (J-5) (B) R-Y Delay **RV409**/DDE-4 (J-4) TRIG : EXT/WFM Bowtie mode  **Spec. Set the each Bowtie dip point of (A) and (B) on the center marker.** **0 ±20 ns**

8-2-2-33. REC S VIDEO Y/C Delay Adjustment

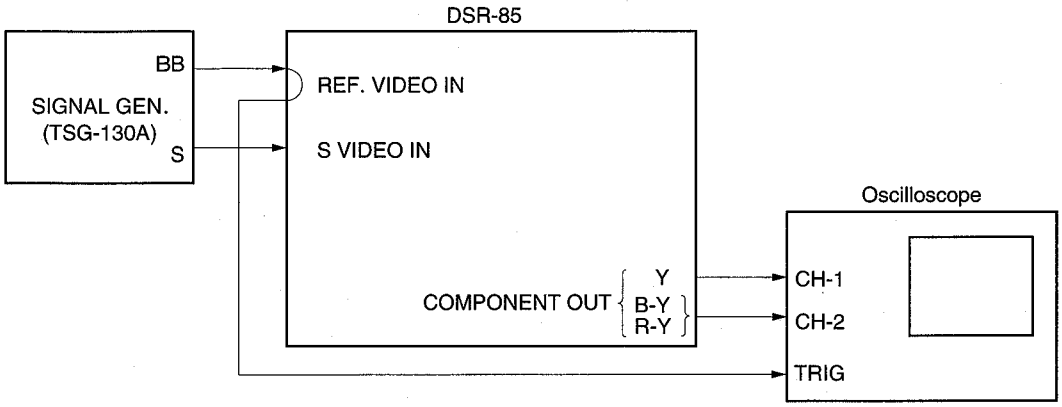
(Connection)

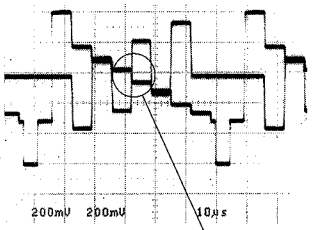
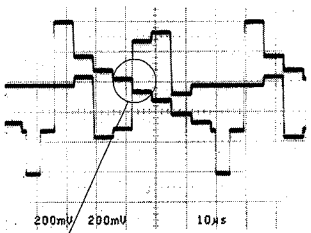
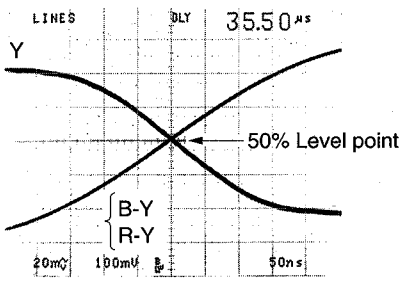


Conditions for adjustment	Adjustment • Specification
• EE mode • S VIDEO IN ; Bowtie (with Mod 12.5T) • VIDEO IN switch/Front panel ; S VIDEO	S VIDEO OUT 1 (75 Ω terminated) B-Y : ⊘**RV405**/DDE-4 (K-5) R-Y : ⊘**RV408**/DDE-4 (K-4)  TRIG : INT/WFM WFM Before adjustment  Minimize ⇩ After adjustment  **Spec.** Flat (0±20 ns)

When the Composite Bowtie (with Mod 12.5T) Signal is not Available

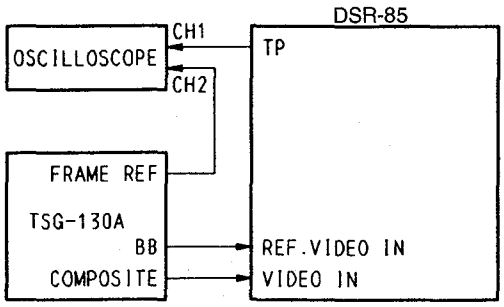
(Connection)

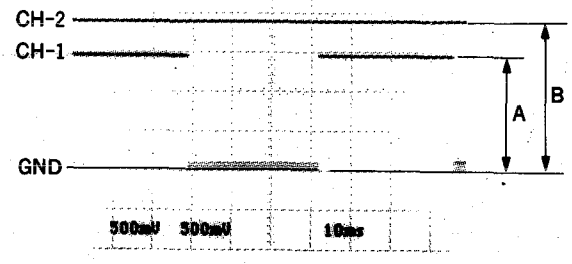
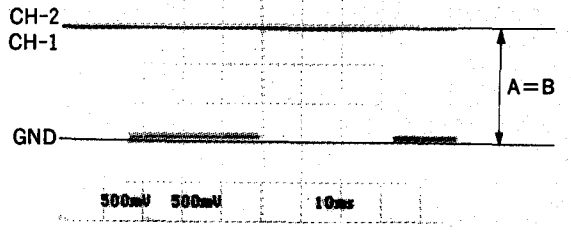
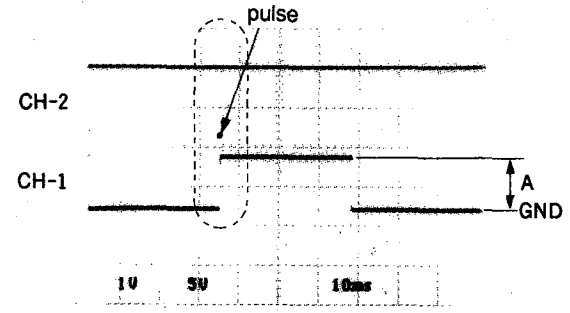


Conditions for adjustment	Adjustment • Specification
• EE mode • S VIDEO IN ; 75 % Color bars • VIDEO IN select/Front panel ; S VIDEO	COMPONENT OUT (75 Ω terminated) B-Y : ⊘**RV405**/DDE-4 (K-5)  R-Y : ⊘**RV408**/DDE-4 (K-4)   **Spec. 0 ±20 ns**

8-2-2-34. Composite SCH Detect Adjustment

(Connection)



Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 75 % Color bar (SCH=0 °) • VIDEO IN siwtch/Front panel ; COMPOSITE	Step 1 Adjust CH-1 : TP304/DDE-4 (G-1) CH-2 : TP305/DDE-4 (G-1) ⊘**RV301**/DDE-4 (G-2) TRIG : CH-1 Oscilloscope Before adjustment  ⇩ After adjustment  **Spec. B=A ±0.05 Vdc**
	Step 2 Check CH-1 : TP306/DDE-4 (H-1) CH-2 : FRAME PULSE/TSG-130A TRIG : CH-1 pulse  Check Coincide CH-2 pulse and CH-1 rising edge.

SECTION 8
ELECTRICAL ALIGNMENT (for PAL)

8-1. ELECTRICAL ALIGNMENT OVERVIEW (for PAL)

8-1-1. List of Adjustment Parts

AU-238

RV400 CH-1 PB Level ..... 8-3 (P)
RV460 CH-2 PB Level ..... 8-3 (P)
RV520 CH-3 PB Level ..... 8-3 (P)
RV580 CH-4 PB Level ..... 8-3 (P)

DDE-4P

CV300 Composite 4Fsc PLL DC ..... 8-20 (P)
CV601 SPCK Error ..... 8-19 (P)
RV100 REC A/D Y Level ..... 8-24 (P)
RV102 REC S VIDEO Chroma Level ..... 8-26 (P)
RV200 REC Composite Y Level ..... 8-25 (P)
RV201 REC Composite Chroma Level ..... 8-26 (P)
RV202 REC Composite Chroma Level ..... 8-26 (P)
RV300 Composite 4Fsc PLL DC ..... 8-20 (P)
RV301 Composite SCH Detect ..... 8-32 (P)
RV400 REC Y Level ..... 8-22 (P)
RV401 REC Component B-Y Level ..... 8-23 (P)
RV402 REC Component R-Y Level ..... 8-23 (P)
RV403 REC Y Clamp Level ..... 8-21 (P)
RV404 REC Composite Y/B-Y Delay ..... 8-27, 8-28 (P)
RV405 REC S VIDEO Y/B-Y Delay ..... 8-30, 8-31 (P)
RV406 REC Component Y/B-Y Delay ..... 8-29 (P)
RV407 REC Composite Y/R-Y Delay ..... 8-27 (P)
RV408 REC S VIDEO Y/R-Y Delay ..... 8-30, 8-31 (P)
RV409 REC Component Y/R-Y Delay ..... 8-29 (P)

DEN-5P

CV100 INT SC Frequency ..... 8-5 (P)
CV101 HCK ..... 8-5 (P)
RV100 REF. Internal SCH Phase ..... 8-18 (P)
RV101 REF. OUT Sync Level ..... 8-18 (P)
RV102 REF. VIDEO OUT Burst Level ..... 8-18 (P)
RV103 ENC V (R-Y) Phase ..... 8-10 (P)
RV104 ENC U (B-Y) Phase ..... 8-10 (P)
RV105 PB INT SCH Phase ..... 8-15 (P)
RV106 REF. CF Phase ..... 8-16 (P)
RV200 S VIDEO OUT Y Level ..... 8-7 (P)
RV201 PB S VIDEO Chroma Level ..... 8-12 (P)
RV301 PB Composite Y/C Delay ..... 8-13 (P)
RV302 PB Composite C/C Delay ..... 8-12 (P)
RV400 VIDEO OUT 1 Y Level ..... 8-8 (P)
RV401 VIDEO OUT 2 Y Level ..... 8-8 (P)
RV402 VIDEO OUT Sync Level ..... 8-8 (P)
RV403 ENC V SC Leak ..... 8-9 (P)
RV404 ENC U SC Leak ..... 8-9 (P)
RV405 ENC R-Y Level ..... 8-11 (P)
RV406 ENC B-Y Level ..... 8-11 (P)
RV407 PB Burst Level ..... 8-11 (P)
RV500 COMPONENT Y OUT Level ..... 8-6 (P)
RV501 COMPONENT B-Y OUT Level ..... 8-6 (P)
RV502 COMPONENT R-Y OUT Level ..... 8-7 (P)
RV504 COMPONENT Y Sync Level ..... 8-6 (P)
RV505 PB COMPONENT Y/B-Y Delay ..... 8-14 (P)
RV506 PB COMPONENT Y/R-Y Delay ..... 8-14 (P)

SY-220

CV101 Character Position ..... 8-3 (P)

8-1-2. Measuring Equipment and Tools

Type of measuring equipment	Equivalent	Remarks
Oscilloscope	Tektronix 2445	150 MHz or more
Video signal generator	TSG-131A (Op.02)	
Waveform monitor	Tektronix 1761 Op. SC/1765 Op. SC	
Audio signal generator	HP339A	
Audio level meter	HP3400A/MeguroMN-446	
Frequency counter	Advantest TR5821	
Extension board	DJ-156 (J-6441-560-A)	
	DJ-157 (J-6441-570-A)	
Blank tape	DVM30ME, DVM30NME	On the market

8-1-3. Reference Tape for Alignment

XH5-1AP2 (8-967-999-26)
Recording contents are followings.

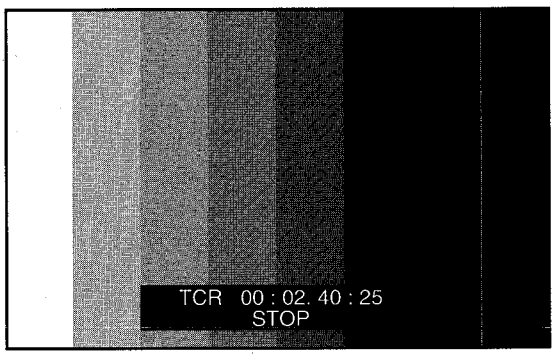
VIDEO	TIME CODE (h) (m) (s)	REC (s)	AUDIO		
Black Burst	23 : 59 : 00	60	No Signal		
100 % Full Color Bars	00 : 00	60	1 kHz		
60 % Multi Burst	01 : 00	60	20 Hz		
Bowtie with Mod 10T	02 : 00	30	14.5 kHz		
Shallow Ramp	02 : 30	30	10 kHz		
	03 : 00	30	No Signal		32 kHz
Cross Hatch (index)	03 : 30	30	1 kHz 0 dBFS		4 ch
Line 17	04 : 00	40	1 ch	1 kHz	
100 % Full Color Bars	04 : 40	40	2 ch		
Quad Phase	05 : 20	40	3 ch		
	06 : 00	40	4 ch		
Black Burst	06 : 40	5	No Signal		
	06 : 45	5			
60 % Multi Burst (for Composite)	06 : 50	60	1 kHz		
Mod 10T	07 : 50	30	20 Hz		
Shallow Ramp (B-Y/R-Y OFF)	08 : 20	30	20 kHz		
	08 : 50	30	10 kHz		
Cross Hatch (index)	09 : 20	30	1 kHz 0 dBFS		
Chroma Noise	09 : 50	30	1 kHz		48 kHz
Line 17	10 : 20	30			2 ch
100 % Full Color Bars	10 : 50	180			
60 % Multi Burst	13 : 50	60			
Mod 10T	14 : 50	30			
Shallow Ramp	15 : 20	60			
100 % Full Color Bars	16 : 20	100			
100 % Full Color Bars (R-Y OFF)	18 : 00	180			
100 % Full Color Bars (B-Y OFF)	21 : 00	180			
Blanking Marker	24 : 00	180			
Line 17 (R-Y OFF)	27 : 00	180			
Line 17 (B-Y OFF)	30 : 00	180			

*** Audio levels are –18 dBFS (Reference), except 1 kHz 0 dBFS part.**

8-2. ADJUSTMENT PROCEDURE (for PAL)

8-2-1. System / Audio Adjustment

8-2-1-1. Character Position Adjustment

Conditions for adjustment	Adjustment • Specification
• CHARACTER : ON • EE mode • VIDEO IN : 100 % Color bars	VIDEO 2 (SUPER) OUT (75 Ω terminated) ⊘**CV101**/SY-220 (F-3)  **Spec. Adjust the character position with a good balance with respect to color bars.**

8-2-1-2. AUDIO PB Level Adjustment

Conditions for adjustment	Adjustment • Specification
• MENU ENHANCED ↓ AUDIO CONTROL ↓ REF LEVEL ; −18 dB • Switch S400 (M-2) S460 (M-1) S520 (M-4) S580 (M-3) } 1, 2 → OFF • PB mode 1 kHz REF. Level (32 kHz, 4ch) /XH5-1AP2	AUDIO OUT CH-1 to 4 (600 Ω loaded) CH-1⊘**RV400**/AU-238 (L-1) CH-2⊘**RV460**/AU-238 (M-1) CH-3⊘**RV520**/AU-238 (L-1) CH-4⊘**RV580**/AU-238 (L-1) **Spec. +4.0 ±0.1 dBu**

8-2-2. Video Adjustment

[Switch Setting]

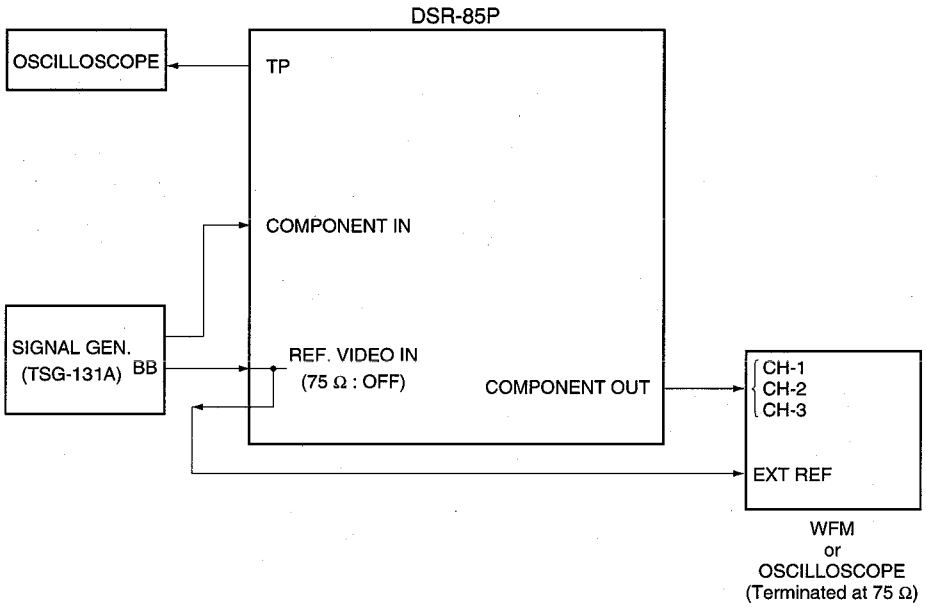
This setting should be fixed in position unless otherwise specified.

LOCAL/REMOTE ; LOCAL
CHARACTER ; ON

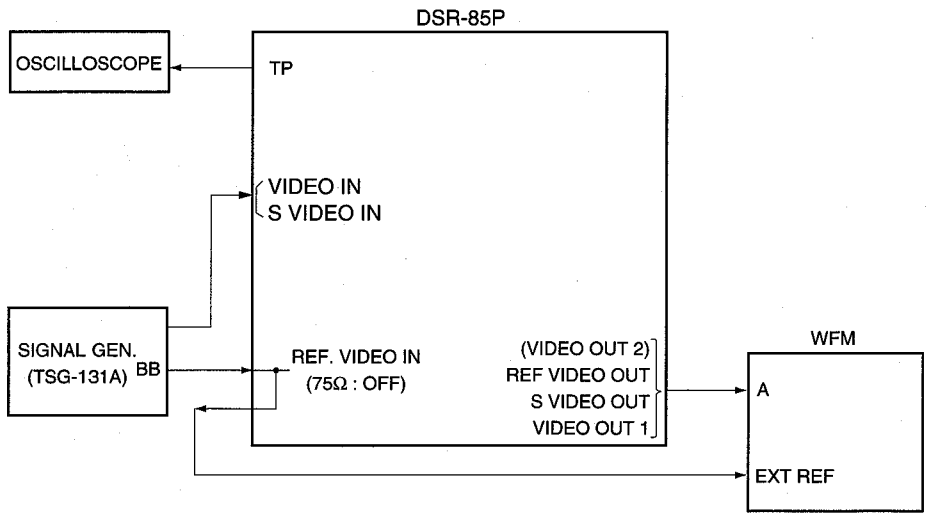
[Connection]

Connect some equipment as following unless otherwise specified.

(Connection 1)

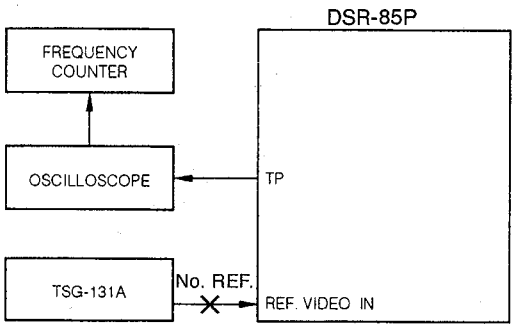


(Connection 2)



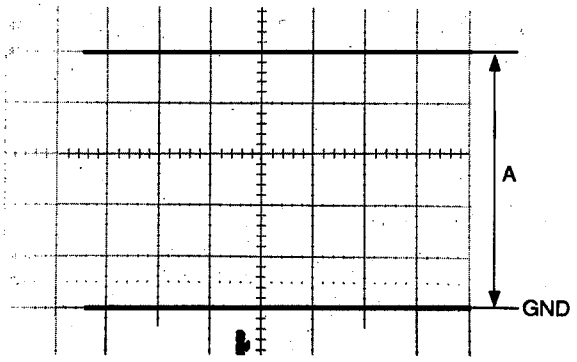
8-2-2-1. INT SC Frequency Adjustment

(Connection)

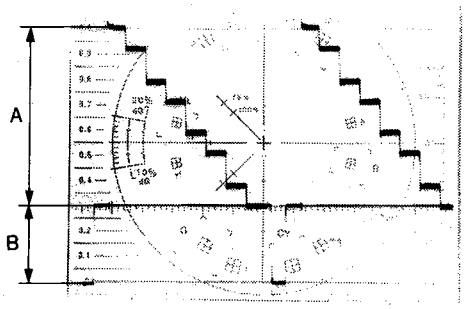


Conditions for adjustment	Adjustment • Specification
• STOP mode • REF. VIDEO IN ; No signal	TP102/DEN-5P (N-3) ⊘**CV100**/DEN-5P (N-1) Frequency counter **Spec. f=4,433,618 ±10 Hz**

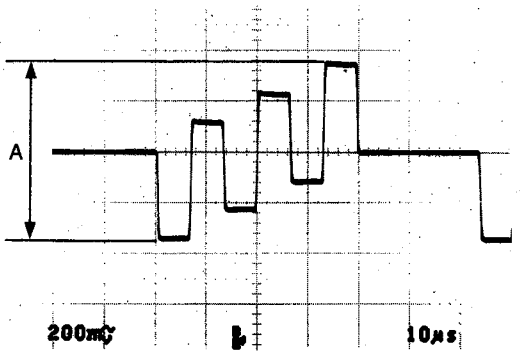
8-2-2-2. HCK Adjustment

Conditions for adjustment	Adjustment • Specification
• STOP mode Connection 1	TP103/DEN-5P (N-2) ⊘**CV101**/DEN-5P (N-2) Oscilloscope  **Spec. A=2.50 ±0.05 Vdc**

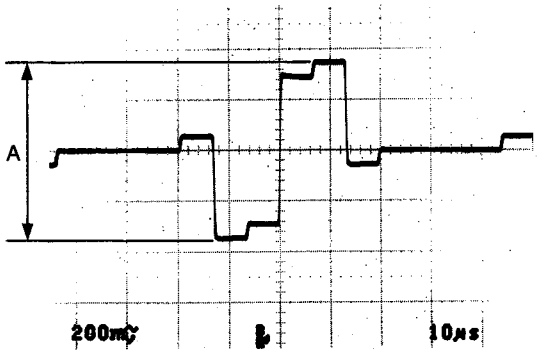
8-2-2-3. COMPONENT Y OUT Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 1	COMPONENT Y OUT (75 Ω terminated) (A) Y Level ⊘**RV500**/DEN-5P (F-1) (B) Y/S-Y SYNC ⊘**RV504**/DEN-5P (H-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0 700 ±0.007 V** **B=0.300 ±0.003 V**

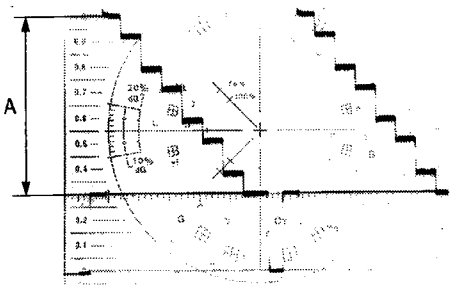
8-2-2-4. COMPONENT B-Y OUT Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 1	COMPONENT B-Y OUT (75 Ω terminated) ⊘**RV501**/DEN-5P (F-1) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

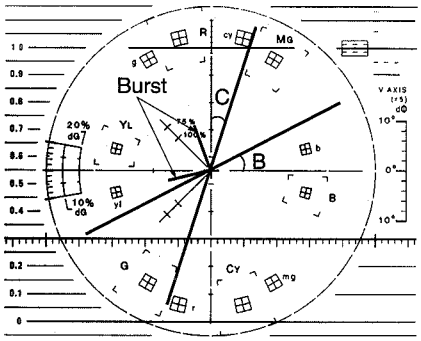
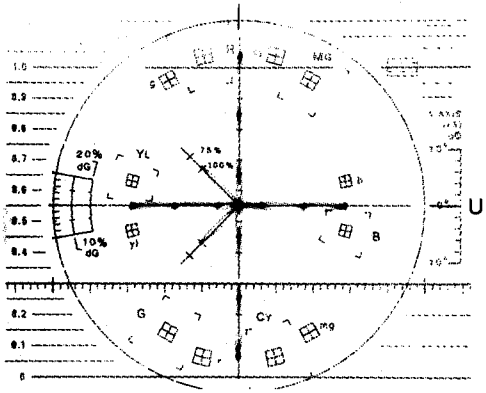
8-2-2-5. COMPONENT R-Y OUT Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 1	COMPONENT R-Y OUT (75 Ω terminated) ●**RV502**/DEN-5P (E-1) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

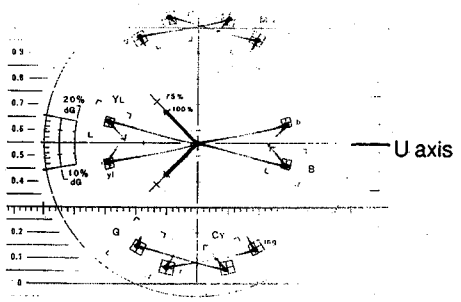
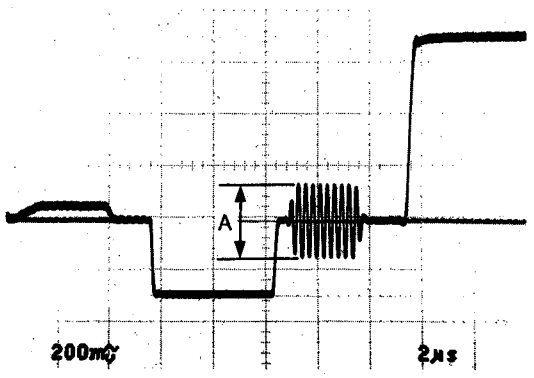
8-2-2-6. S VIDEO OUT Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 2	S VIDEO (Y) OUT (75 Ω terminated) ●**RV200**/DEN-5P (H-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

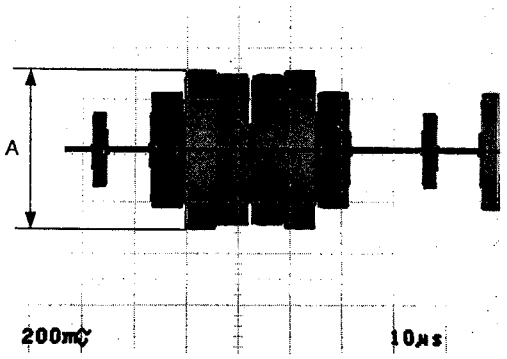
8-2-2-10. U-V Axis (B-Y, R-Y) Phase Adjustment

Conditions for adjustment	Adjustment • Specification
[Flow] (A) Burst preset • PB mode Quad Phase/XH5-1AP2 (05:20-06:00) (B) U-axis phase adjustment • PB mode Quad Phase/XH5-1AP2 (05:20-06:00) (C) V-axis phase adjustment • PB mode Quad Phase/XH5-1AP2 (05:20-06:00) Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Burst preset ⊘**PHASE control**/Vector (B) U-axis (HUE) ⊘**RV104**/DEN-5P (N-1) (C) V-axis (U/V OFFSET) ⊘**RV103**/DEN-5P (N-1) TRIG : REF. VIDEO Vector (Before adjustment)  (After adjustment) V axis  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) Set the dots of the B-Y on the U axis of the vector.** **(C) Set the dots of the R-Y on the V axis of the vector.** **B, C=0 ±0.5 °**

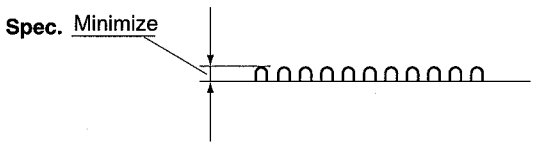
8-2-2-11. PB VIDEO OUT 1 Chroma/Burst Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 2	VIDEO OUT 1 (75 Ω terminated) Step 1 C level (A) Burst ⊘**PHASE control**/Vector (B) ENC R-Y Level ⊘**RV405**/DEN-5P (H-1) ENC B-Y Level ⊘**RV406**/DEN-5P (H-1) TRIG : REF. VIDEO Vector  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) All dots should be inside the "⊞" mark on the vector by adjustment RV405 and RV406 alternately.**
	Step 2 Burst level ⊘**RV407**/DEN-5P (J-1) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.300 ±0.003 V**

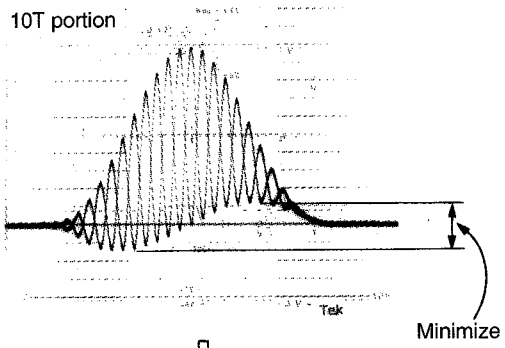
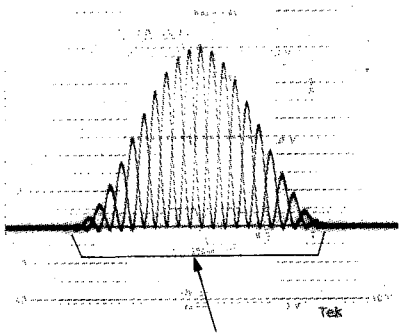
8-2-2-12. PB S VIDEO Chroma Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 2	S VIDEO (C) OUT (75 Ω terminated) ⊘**RV201**/DEN-5P (K-1) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.885 ±0.006 V**

8-2-2-13. PB Composite C/C Delay Adjustment

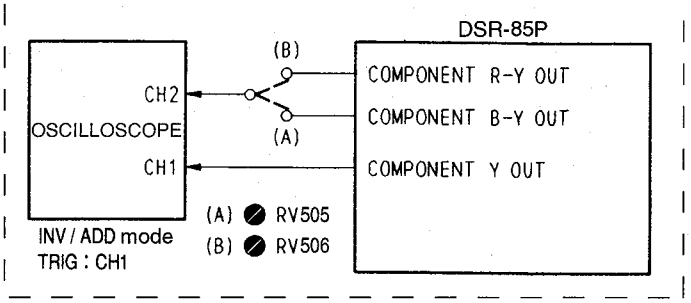
Conditions for adjustment	Adjustment • Specification
• PB mode Bowtie/XH5-1AP2 (02:00-02:30) Connection 2	CH-1/Oscilloscope TP301/DEN-5P (F-2) ⊘**RV302**/DEN-5P (B-1) CH-2/Oscilloscope TP302/DEN-5P (F-3) Oscilloscope Vertical mode : INV +ADD **Spec.** Minimize 

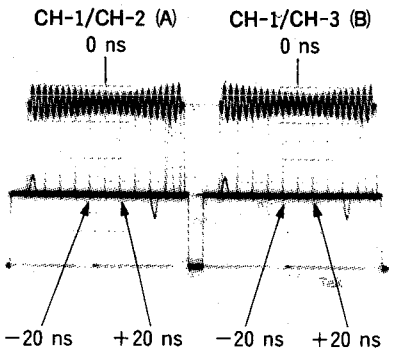
8-2-2-14. PB Composite Y/C Delay Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode Mod 10T/XH5-1AP2 (07:50-08:20) Connection 2	VIDEO OUT 1 (75 Ω terminated) ⊘**RV301**/DEN-5P (B-1) TRIG : INT/WFM WFM Before adjustment 10T portion  Minimize ⇩ After adjustment  **Spec.** Flat

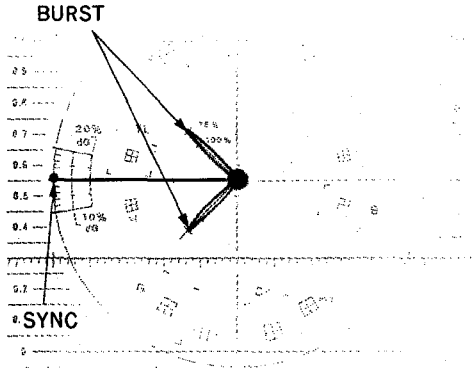
8-2-2-15. PB Component Y/C Delay Adjustment

[Connection for reference] Using for an oscilloscope



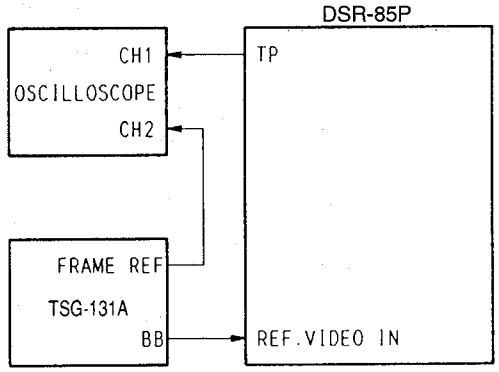
Conditions for adjustment	Adjustment • Specification
• PB mode Bowtie/XH5-1AP2 (02:00-02:30) Connection 1	COMPONENT OUT (75 Ω terminated) (A) B-Y Delay **RV505**/DEN-5P (F-1) (B) R-Y Delay **RV506**/DEN-5P (G-1) TRIG : EXT/WFM Bowtie mode  **Spec. Set the each Bowtie dip point of (A) and (B) on the center marker.** **0 ±20 ns**

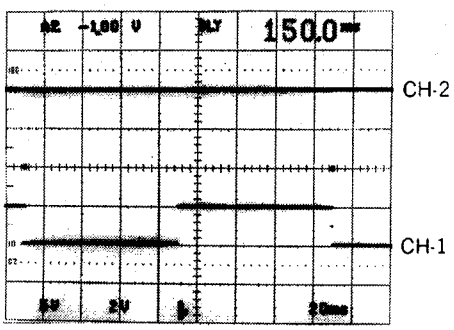
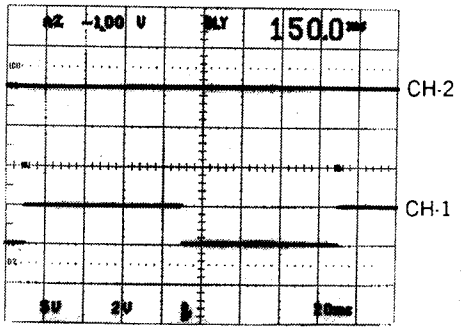
8-2-2-16. PB INT SCH Phase Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 • REF. VIDEO IN ; No signal • After adjustment, connect REF. VIDEO IN. Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Burst Preset **⊘PHASE control**/Vector (B) INT SC **⊘RV105**/DEN-5P (N-1) TRIG : INT/WFM SCH mode  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) The SYNC should be in the center of the bursts (SCH=0 °).**

8-2-2-17. REF. CF Phase Adjustment

(Connection)



Conditions for adjustment	Adjustment • Specification
• EJECT mode	CH-1/Oscilloscope TP105/DEN-5P (K-1) **RV106**/DEN-5P (K-1) CH-2/Oscilloscope FRAME PULSE/TSG-131A TRIG : FRAME PULSE (CH-2) Oscilloscope (NG)  CH-2 CH-1 ⇩ (OK)  CH-2 CH-1

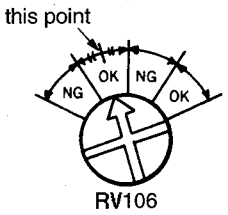
Spec. (1) Turn RV106 counterclockwise fully.

(2) When RV106 is turned clockwise gradually, the phase condition between CH-1 and CH-2 changes from NG to OK or OK to NG.

(3) In case of the pattern of change is started from NG as shown in the following illustration, set RV106 to mechanical center of range of first OK.

NG → OK → NG → OK

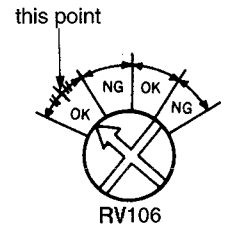
the mechanical center of this range



(4) In case of the pattern of change is started from OK as shown in the following illustration, set RV106 to mechanical center of range of first OK.

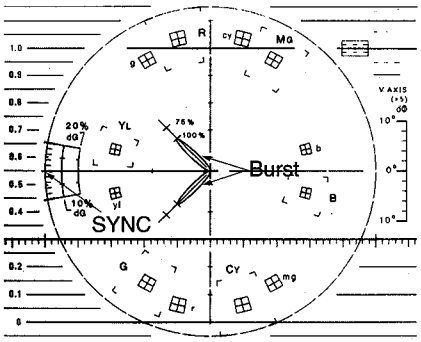
OK → NG → OK → NG

the mechanical center of this range

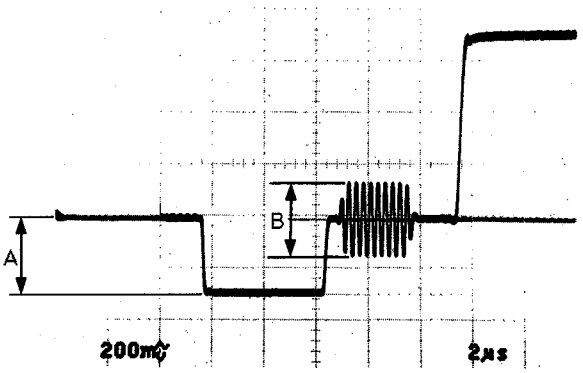


* If the range of first OK is extremely narrow, set to mechanical center of range of second OK.

8-2-2-18. REF. Internal SCH Phase Adjustment

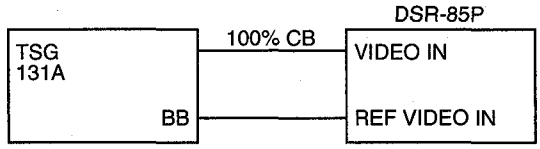
Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 • REF. VIDEO IN ; No signal • After adjustment is completed, re-connect the REF. VIDEO IN. Connection 2	REF. VIDEO OUT (75 Ω terminated) (A) Burst Preset ⊘**PHASE control**/Vector (B) Sync Phase ⊘**RV100**/DEN-5P (K-1) TRIG : INT/WFM SCH mode  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) The SYNC should be in the center of the bursts (SCH=0 ±3 °).**

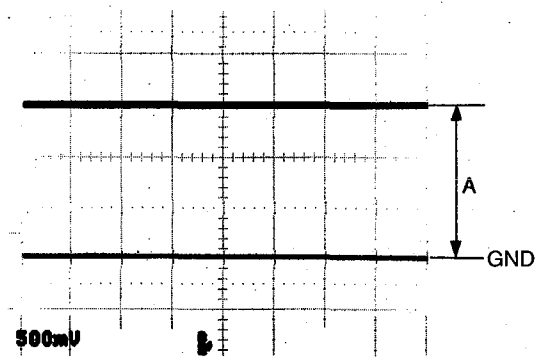
8-2-2-19. REF. VIDEO OUT Sync/Burst Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 2	REF. VIDEO OUT (75 Ω terminated) (A) Sync Level ⊘**RV101**/DEN-5P (K-4) (B) Burst Level ⊘**RV102**/DEN-5P (K-4) TRIG : INT/WFM WFM or Oscilloscope  **Spec. A, B=0.300 ±0.003 V**

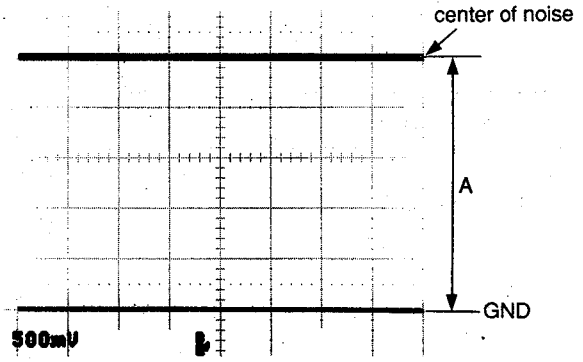
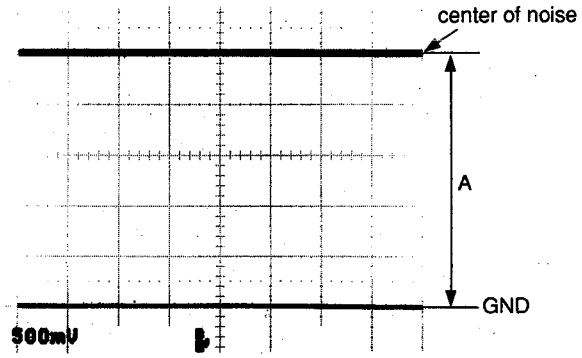
8-2-2-20. SPCK Error Adjustment

(Connection)

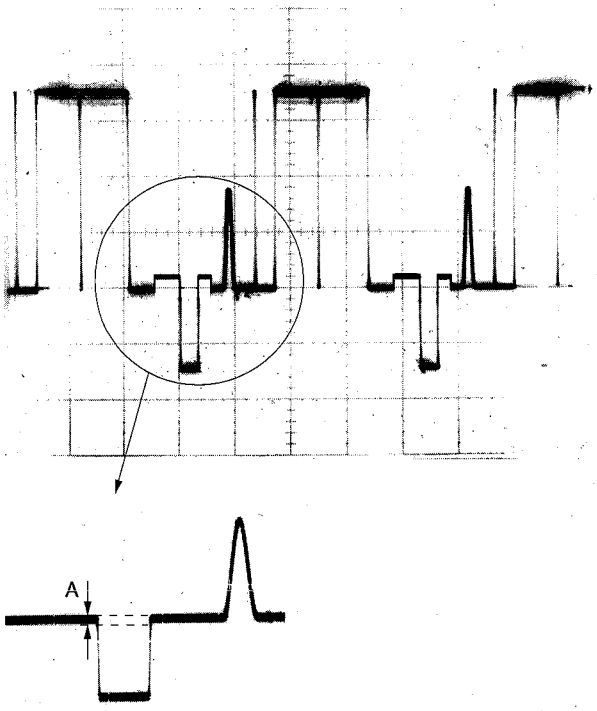


Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 100 % Color bars	TP601/DDE-4P (B-2) ⊘**CV601**/DDE-4P (B-3) Oscilloscope  **Spec. A=1.5 ±0.1 Vdc**

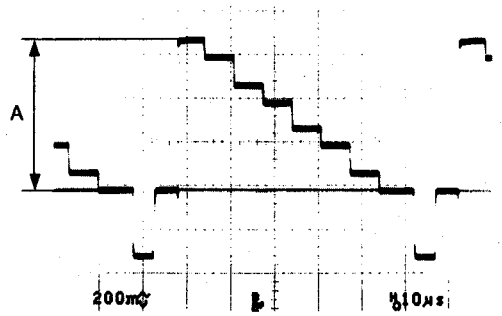
8-2-2-21. Composite 4Fsc PLL DC Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; Composite 100 % Color bars • VIDEO IN select/Front panel ; COMPOSITE	TP301/DDE-4P (L-1) ⊘**CV300**/DDE-4P (L-1) Oscilloscope  **Spec. A=2.50 ±0.05 Vdc**
	TP300/DDE-4P (J-1) ⊘**RV300**/DDE-4P (J-2) Oscilloscope  **Spec. A=2.50 ±0.05 Vdc**
Connection 2	

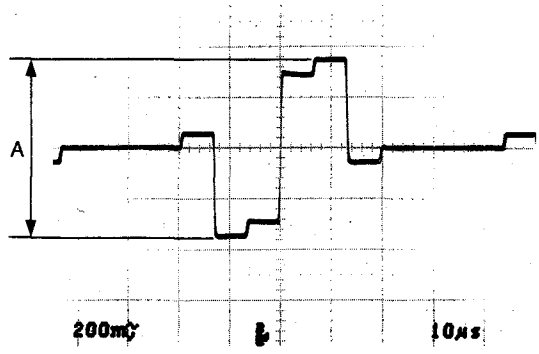
8-2-2-22. REC Y Clamp Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • COMPONENT IN ; Pluse & Bar Connection 1	COMPONENT Y OUT (75 Ω terminated) ⊘**RV403**/DDE-4P (J-3) WFM or Oscilloscope  **Spec. A=Minimize the level difference A at Pedestal.**

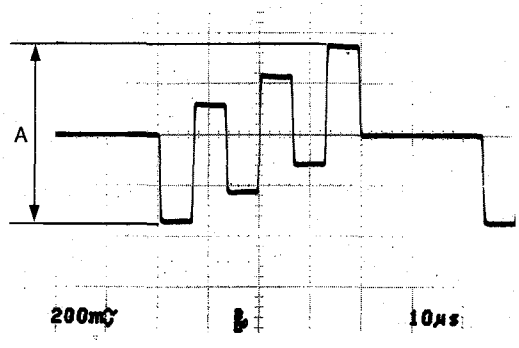
8-2-2-23. REC Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • COMPONENT IN ; 100 % Color bars Connection 1	COMPONENT Y OUT (75 Ω terminated) ●**RV400**/DDE-4P (J-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

8-2-2-24. REC Component R-Y Level Adjustment

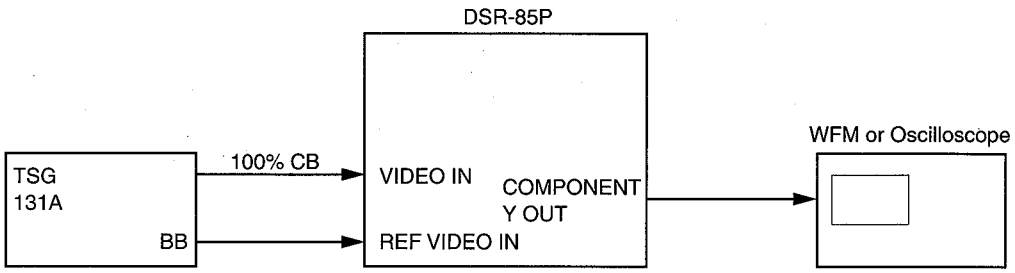
Conditions for adjustment	Adjustment • Specification
• EE mode • COMPONENT IN ; 100 % Color bars Connection 1	COMPONENT R-Y OUT (75 Ω terminated) ●**RV402**/DDE-4P (J-4) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

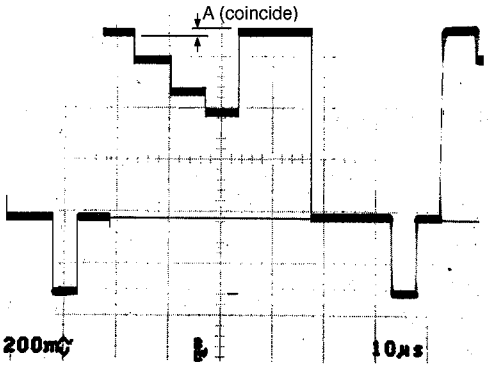
8-2-2-25. REC Component B-Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • COMPONENT IN ; 100 % Color bars Connection 1	COMPONENT B-Y OUT (75 Ω terminated) ●**RV401**/DDE-4P (J-5) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

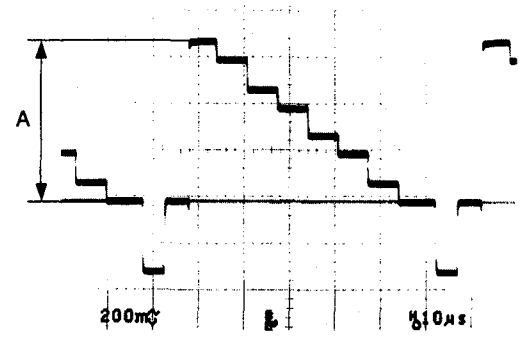
8-2-2-26. REC A/D Y Level Adjustment

(Connection)

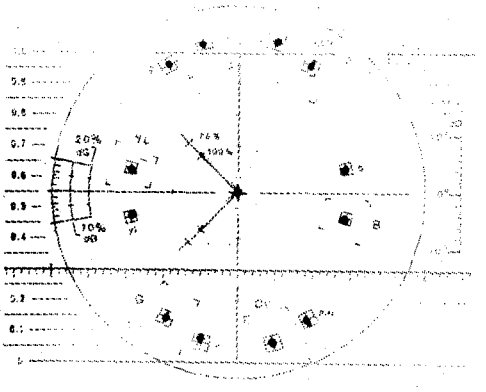


Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 100 % Color bars • VIDEO IN select/Front panel ; COMPOSITE • S501-1/SY-220 (M-1) ; ON • S200/DDE-4P (N-1) ; ON	COMPONENT Y OUT (75 Ω terminated) **RV100**/DDE-4P (N-3) TRIG : REF. VIDEO WFM or Oscilloscope 
• After Adjustment, S501-1, S200 ; OFF	**Spec. A=0 ±0.007 V**

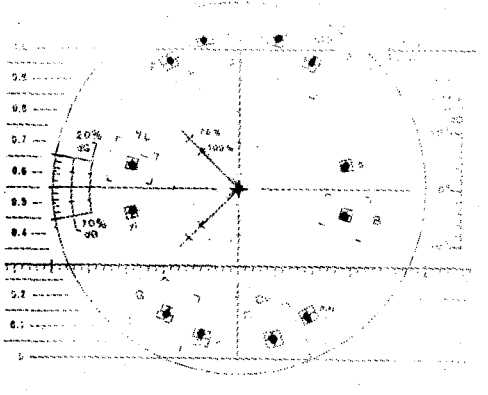
8-2-2-27. REC Composite Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 100 % Color bars • VIDEO IN select/Front panel ; COMPOSITE Connection 2	VIDEO OUT 1 (75 Ω terminated) ●**RV200**/DDE-4P (M-4) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

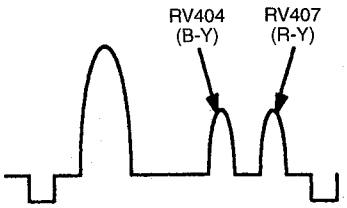
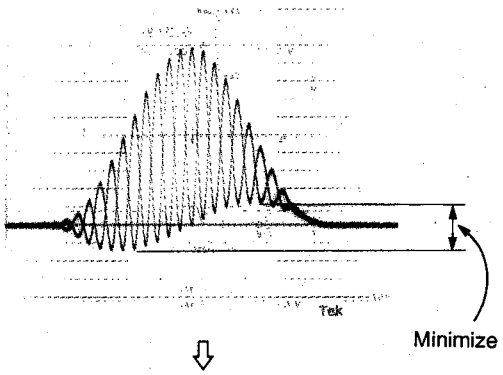
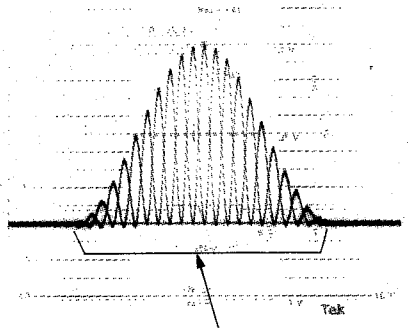
8-2-2-28. REC Composite Chroma Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 100 % Color bars • VIDEO IN select/Front panel ; COMPOSITE Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Burst ●**PHASE control**/Vector (B) Composite Chroma Level ●**RV201**/DDE-4P (M-4) ●**RV202**/DDE-4P (M-4) TRIG : REF. VIDEO Vector  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) All dots should be inside the "⊞" mark on the vector.**

8-2-2-29. REC S VIDEO Chroma Level Adjustment

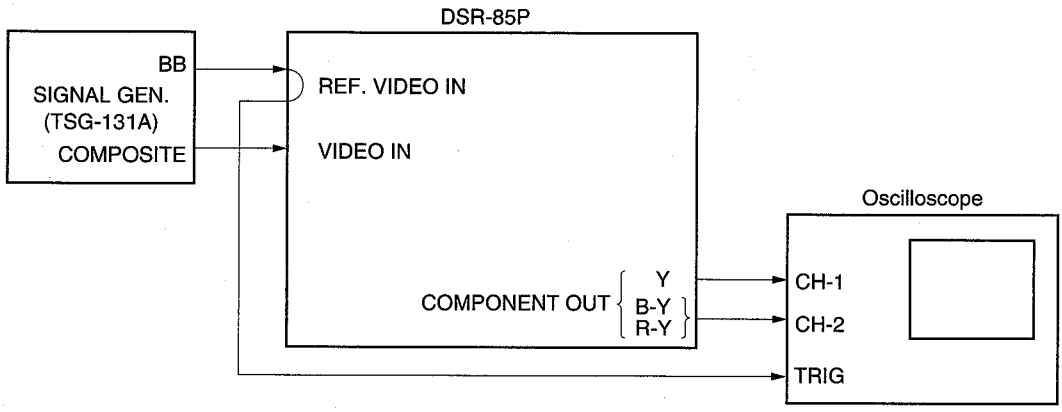
Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 100 % Color bars • VIDEO IN select/Front panel ; S VIDEO Connection 2	S VIDEO (C) OUT (75 Ω terminated) (A) Burst ●**PHASE control**/Vector (B) S-C Level ●**RV102**/DDE-4P (P-4) TRIG : REF. VIDEO Vector  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) All dots should be inside the "⊞" mark on the vector.**

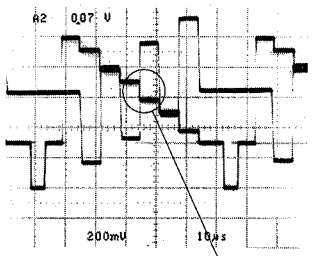
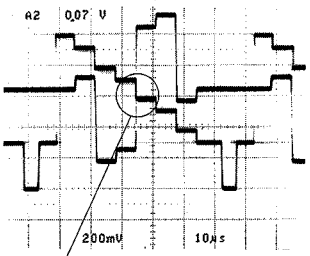
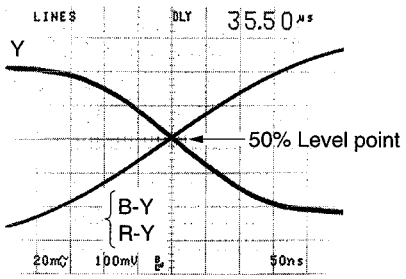
8-2-2-30. REC Composite Y/C Delay Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; Bowtie (with Mod 10T) • VIDEO IN switch/Front panel ; COMPOSITE Connection 2	VIDEO OUT 1 (75 Ω terminated) B-Y : ⊘**RV404**/DDE-4P (K-5) R-Y : ⊘**RV407**/DDE-4P (K-4)  TRIG : EXT/WFM WFM Before adjustment  ⇩ After adjustment  **Spec.** Flat (0±20 ns)

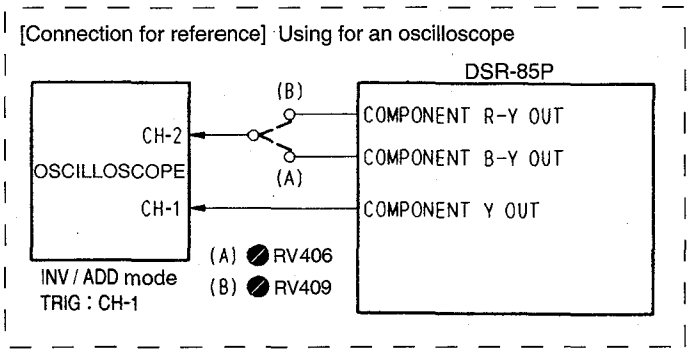
When the Composite Bowtie (with Mod 10T) Signal is not Available

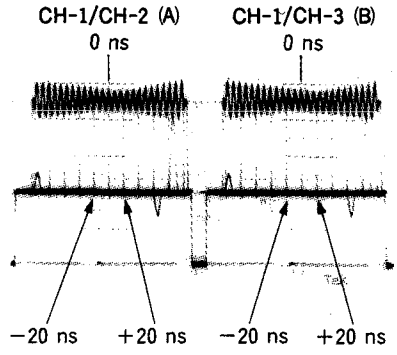
(Connection)



Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 100 % Color bars • VIDEO IN select/Front panel ; COMPOSITE	COMPONENT OUT (75 Ω terminated) B-Y : ⊘**RV404**/DDE-4P (K-5)  R-Y : ⊘**RV407**/DDE-4P (K-4)   **Spec. 0 ±20 ns**

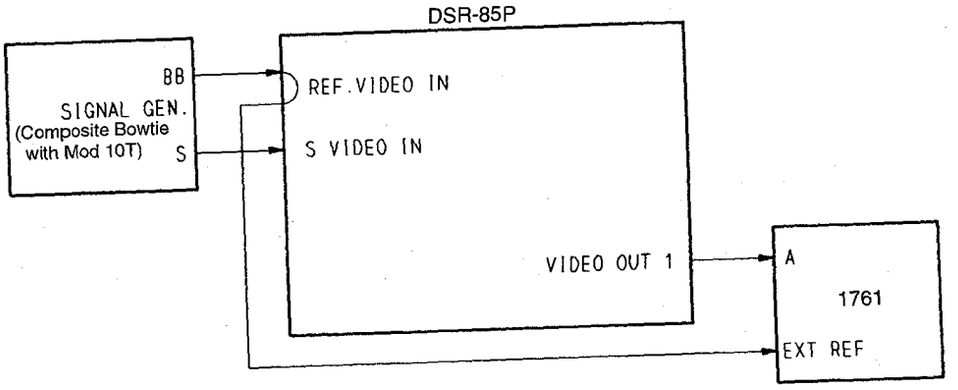
8-2-2-31. REC Component Y/C Delay Adjustment

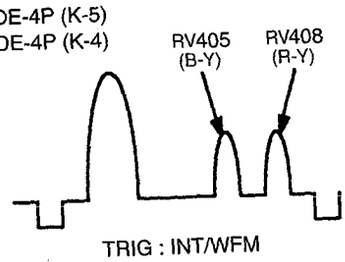
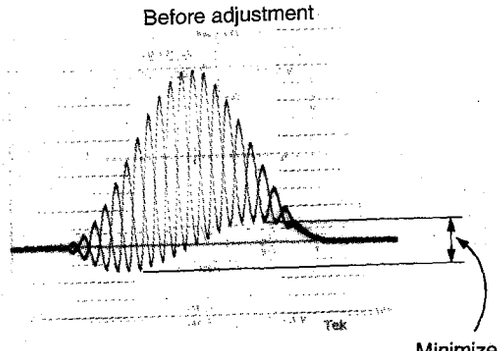
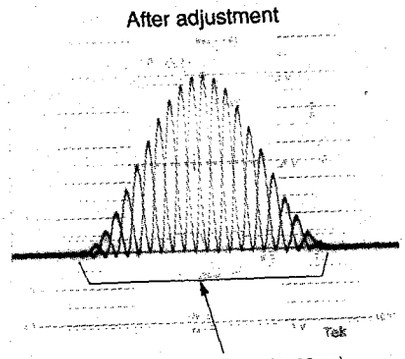


Conditions for adjustment	Adjustment • Specification
• EE mode • COMPONENT IN ; Bowtie Connection 1	COMPONENT OUT (75 Ω terminated) (A) B-Y Delay **RV406**/DDE-4P (J-5) (B) R-Y Delay **RV409**/DDE-4P (J-4) TRIG : EXT/WFM Bowtie mode  **Spec. Set the each Bowtie dip point of (A) and (B) on the center marker.** **0 ±20 ns**

8-2-2-32. REC S VIDEO Y/C Delay Adjustment

(Connection)

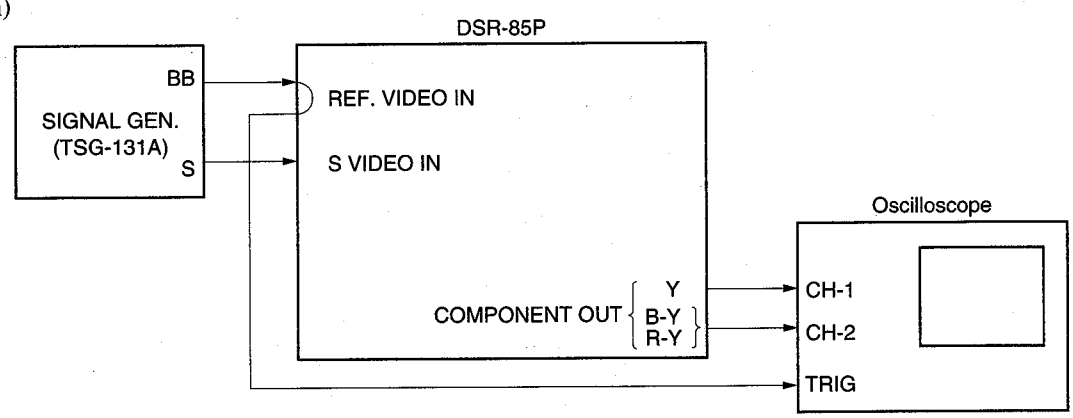


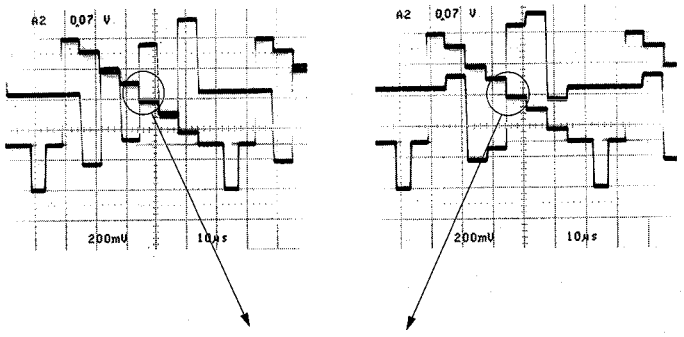
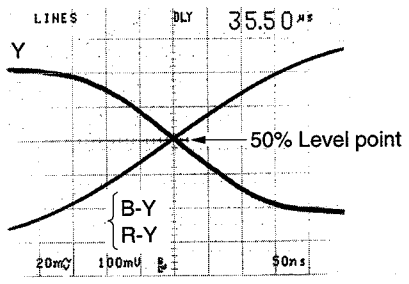
Conditions for adjustment	Adjustment • Specification
• EE mode • S VIDEO IN ; Bowtie (with Mod 10T) • VIDEO IN switch/Front panel ; S VIDEO	S VIDEO OUT 1 (75 Ω terminated) B-Y : ⊘**RV405**/DDE-4P (K-5) R-Y : ⊘**RV408**/DDE-4P (K-4)  TRIG : INT/WFM WFM Before adjustment  Minimize ⇩ After adjustment  **Spec.** Flat (0±20 ns)

DSR-85/85P

When the Composite Bowtie (with Mod 10T) Signal is not Available

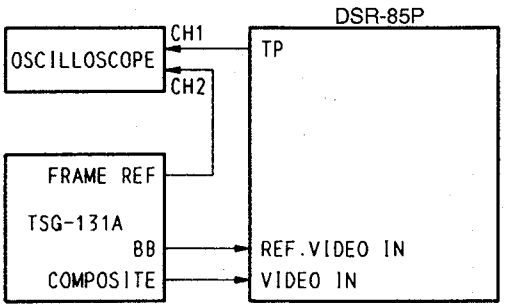
(Connection)

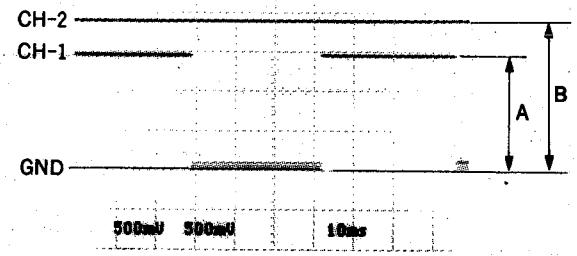
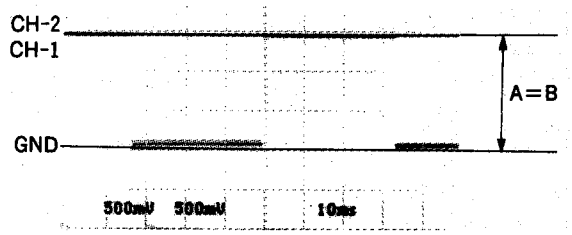
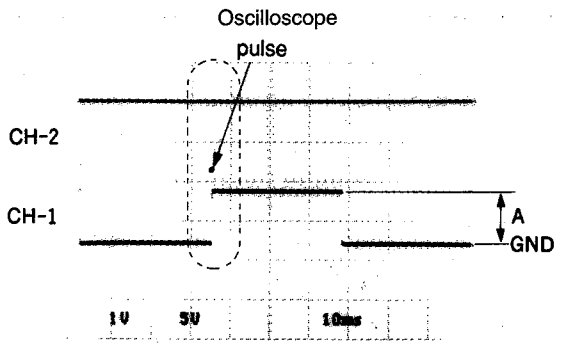


Conditions for adjustment	Adjustment • Specification
• EE mode • S VIDEO IN ; 100 % Color bars • VIDEO IN select/Front panel ; S VIDEO	COMPONENT OUT (75 Ω terminated) B-Y : ⌀**RV405**/DDE-4P (K-5) R-Y : ⌀**RV408**/DDE-4P (K-4)   **Spec. 0 ±20 ns**

8-2-2-33. Composite SCH Detect Adjustment

(Connection)



Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 100 % Color bar (SCH=0 °) • VIDEO IN siwtch/Front panel ; COMPOSITE	Step 1 Adjust CH-1 : TP304/DDE-4P (G-1) CH-2 : TP305/DDE-4P (G-1) ⊘**RV301**/DDE-4P (G-2) TRIG : CH-1 Oscilloscope Before adjustment  ⇩ After adjustment  **Spec. B=A ±0.05 Vdc**
	Step 2 Check CH-1 : TP306/DDE-4P (H-1) CH-2 : FRAME PULSE/TSG-131A TRIG : CH-1 Oscilloscope  Check Coincide CH-2 pulse and CH-1 rising edge.